AMERICAN JOURNAL OF PUBLIC HYGIENE

OFFICIAL ORGAN OF THE
Massachusetts Association of Boards of Health
AND OF THE
American Public Health Association

$1.50 per Year 40 Cents per Copy

COPYRIGHT 1909 BY B. R. RICKARDS

Published quarterly during the months of February, May, August and November. B. R. Rickards, Publisher.

All communications concerning the Journal, copy, proof, subscriptions, advertisements, etc., should be addressed to the Managing Editor, B. R. RICKARDS, 1404 Eastwood Ave., Columbus, Ohio.

Vol. XIX. NOVEMBER, 1909. No. 4

(New Series. Vol. V., No. 4.)

EDITORIALS

PUBLIC HEALTH AND THE AMERICAN PUBLIC HEALTH ASSOCIATION.*

In these days when so much is being said and done, relating to public health, when hygiene may almost be regarded as the great popular fad, it should be worth the while of all whose interests have been awakened in such matters, and especially of those who are professionally engaged in Public Health work, to glance briefly at some of the agencies which have contributed to, and perhaps are chiefly responsible for this changed attitude of the public mind.

For that it is a changed attitude there can be no doubt. And nothing shows this more than the criticisms that

*Read at the Meeting of the American Public Health Association at Richmond October, 1909.

public health officials meet with now compared with those which met them comparatively a few years ago. Then the chief thing they had to contend with was public apathy and even opposition. They were criticized for what they did, especially if it caused temporary annoyance or even slight financial loss to individuals. Now, their chief criticism is for what they do not do. They are held responsible for every outbreak of contagious disease, and the people of a community look with complacency, almost, upon much personal annoyance, and expense, if sanitary betterment is the cause.

Now, to very many people, perhaps the majority, this change of public sentiment seems a sudden thing and largely due to a few individuals whose writings are familiar. No sanitarian would say a word to detract from the credit of these men. We welcome them heartily to the ranks of public health workers, and give them their full mead of praise for what they have done, but we claim very strenuously that this admirable public awakening is not a sudden growth and of virgin soil, but the coming to maturity of seeds planted long ago, the young plants from which have been watered and shielded by devoted individuals whose names are known to but few.

The American Public Health Association was founded by those earnest, devoted men, and the records of its meetings are the best possible evidence of the chief place it holds in the development of public hygiene in the United States. It was at its yearly meetings that every great advance in practical sanitation in this country has been presented and discussed, and its endorsement or disapproval has heartened the scientific worker and discouraged the charlatan as no other agency has.

It was the 18th of April, 1872, that the first meeting was held, which resulted, the following September, in forming, at Long Branch, N. Y., the American Public Health Association. It was probably by accident that the

day on which this movement began was so nearly the one hundredth anniversary of that famous ride of Paul Revere, to warn the minute men through all that "Middlesex village and farm" "to up and to arm" against the foe who were threatening their liberties. But to us it is significant that this first call to united action against a far greater tyranny and more subtle foe, than that represented by these troops marching upon Concord and Lexington should come upon that day also. That first meeting for organization at Long Branch, Sept. 12, 1872, was wholly devoted to getting ready for work. Officers were elected and committees appointed, and it is of great interest to notice, that then, as now, the Association was not made up of physicians only, but of those prominent in any profession which touched upon public health. Such men as Dorman B. Eaton, the public-spirited lawyer, and C. F. Chandler, the chemist, and Frederick Law Olmstead, the landscape gardener, were there consulting with such physicians as J. H. Rauch, Elisha Harris, Hosmer Johnson, and others of equal prominence in the leading cities of the country, from Boston to San Francisco. It is also significant that at that first meeting, a committee was appointed to urge the establishment of a National Sanitary Bureau, and from that day to this, hardly a meeting of the Association has been held at which the establishment of such a bureau has not been advocated. At that time six States only had boards of health, Mass., Cal., Mich., La., Minn., Va., and one of the first works of the Association was to urge their establishment in all of the States, and from that time such boards began to be created quite rapidly, so that at the seventh meeting held in 1878 at Richmond, Va., there were representatives present from the following State boards: Tenn., Mich., Ala., Wis., Mass., Conn., Ark., S. C., Del., N. Y., La., N. J., Ky., Ill., Mo., Miss., and doubtless others had been established which were not represented at that meeting.

Another evidence of the growing interest in the Association was its rapid growth in membership. At the first meeting where papers were read, which was at Cincinnati in 1873, there were less than twenty-five regular members in attendance and probably not more than fifty members in the Association, and at the second meeting there were so few members present that no business could be done for lack of a quorum, and the Association was forced to dissolve and reform itself, and adopt a new constitution, which was really the old one with one or two amendments, one of which was, that nine members should be a quorum for the election of officers. But from that time on there was no trouble about a quorum, for at the fourth meeting ninety-six new members were elected, and when they came together for the seventh meeting the membership had increased to a little over five hundred.

When one scans those lists of new members who were flocking to our Association in those early days he cannot help coming to the conclusion that it was then thought to be a duty which leading citizens all over the country owed to their country to enroll themselves in the American Public Health Association. Thus among those new members elected at that fourth meeting, there were representatives of ten States, and such names appear as, Edward Everett Hale and Prof. Wolcott Gibbs, Marshall Field and L. L. Leiter, and Franklin McVeagh and George M. Pullman, T. Sterry Hunt, Hon. Emory Washburn, and in fact you hardly find a man eminent in later years, or at that time whose name does not appear in those old membership lists.

The present "Committee of One Hundred" on Public Health is a remarkable gathering of able public-spirited men, but an even more representative committee of one hundred could have been selected from the active membership of this Association twenty-five years ago.

In 1873 came our last great epidemic of Asiatic cholera,

which extended its ravages over thirteen States of the Union. It was the American Public Health Association, more than any other influence which made it the last visitation of that scourge. They boldly took the position, when as yet there was no science of bacteriology, that, mysterious as was its origin and spread, it could be conquered by sanitary measures, and especially by cleanliness, pure water, pure air and pure food. The whole question was gone over in a careful scientific way, and Dr. Elisha Harris, the first secretary of the Association, in a paper remarkable for its breadth and acuteness, called, "Practical Conclusions Concerning Cholera," summed up the case and pointed out the way to victory.

And so it has been ever since. The history of the progress of practical and scientific public hygiene, in the United States of America is writ large, and writ nowhere else so fully and completely, as in the proceedings of the American Public Health Association. And the great beauty and strength of its work has been its independence and breadth. Dr. Harris, its first secretary, says at the beginning of the first volume of Proceedings, that it was established as a voluntary Association, free from all official and governmental control, in order to secure for it just that independence which has been such a marked feature of its work. It has welcomed to its councils every one who has had a genuine interest in hygiene, and the true scientific spirit, but has not hesitated to condemn, remorselessly, the mere exploiter of hygiene for private purposes. It is not too much to say that many a man engaged in public health work has gone to his home, after attendance upon one of its annual meetings, with far nobler views of his profession than he had before.

It should be remembered also that its work has not been limited to the United States of America. It has gradually admitted to its membership the other countries of North America, Canada, and Mexico, and also the island

Republic of Cuba. Thus any great sanitary advance advocated by it, has the co-operation of the wisest sanitarians of the whole continent. The great victory over yellow fever, for example, has been much more easily obtained because of the assistance of the Mexican and Cuban governments, and the greatest factor in that assistance has been Dr. Leiceaga of Mexico City, a former president of this Association, and such men as Drs. Guiterras and Agramonte of Cuba, who have both been officers of it. So when epidemics of small-pox threaten the States bordering on Canada, the health officers of those States know that they can count on the active assistance of the Canadian authorities because Dr. Frederick Montizambert, a worthy ex-president of the Association and constant attendant upon its conventions, is the chief of the health department of that country, and every province has sanitary workers who are members also. At the very last meeting, in Richmond, Virginia, it was an inspiring sight to see such men and many others earnestly consulting together, not about academic questions, but concerning the practical problems of public health, how these could be solved most efficiently.

But great as has been its work, it must not rest upon its laurels, but must go forward in greater usefulness. One advance is especially demanded, and that is a strong, well supported journal, through which its work and discussions may be rapidly put into the hands of all its members. The development of the science of hygiene makes the publication of its proceedings in the annual volumes insufficient and out of date. Important discoveries should be known of quickly as possible to be of the greatest use. This can only be done through a journal frequently issued. The experiment has been tried of making use for this purpose, of the "American Journal of Public Hygiene," and as far as the scientific side of the question is concerned it has been a success. Such a journal has as yet no competitor

in the field, and supplies an evident need. But it needs more money to support it and push its sale than the Association with its hitherto limited membership can well supply. The editors of that journal are busy men, and cannot be expected to long give their time to caring for it without pecuniary reward. A larger membership list, or some gifts for the special purpose, or better both, will solve the problem. Is it inconceivable that both of these results can be brought about? We think not, if the task is set about in the proper way. For to repeat what has been several times said, the American Public Health Association represents on this continent, as no other organization does, scientific, sane, hygienic progress and shall it not be fostered?

FRANKLIN C. ROBINSON.

SOME OF THE PRESENT NEEDS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.*

Since the Association was started in 1872, it has conducted its affairs under a constitution that has served long and well. As the Association has grown in size, important changes have been made in it until, contradictory and ambiguous in parts, a thing of shreds and patches, it was discarded last year for one more suited to its present needs.

Altho, as might be expected, some minor imperfections have been detected, the adoption of the new constitution has undoubtedly been a long step in advance, but like all new things, we must become accustomed to it before it will show itself at its best.

Last year the Association voted to publish its papers and proceedings in Journal form in place of the time honored annual volume. In attempting to carry out your wishes a number of suggestions have come to the mind of the writer.

Believing that under the new constitution, many things are now possible that were not previously, and believing that with active vigorous work the Association will grow as never before, I desire to place these before you for your consideration.

Finances and Publication.

Last year your executive committee was confronted with the fact that its expenses had exceeded its income by about

*Read before the American Public Health Association at Richmond, Va., October, 1909.

$1700.00 at the time of the meeting, not counting certain bills not then rendered. This deficit was attributed largely to the increased cost of publication due in part to increase in the size and activity of the Association's oldest child, the Laboratory Section, and to the birth the year previous of a vigorous section on Vital Statistics. Thus the number of papers for publication was more than doubled and with still another new Section formed, the Association was confronted with a most serious problem which was temporarily solved by the decision to cut down the number of pages published to 400, or about the number that the general Association alone required, if all its papers were published in full. To accomplish this seemingly impossible feat it became necessary for the publication committee to ruthlessly require that practically all papers of more than three or four hundred words in length be abstracted.

Such a policy while absolutely essential in the present emergency would be if long continued absolutely suicidal. Of what use is it to spend time, energy and thought on a paper for publication if it is to be cut almost beyond recognition before it can appear in print. Particularly is this true of technical papers which are often based on months of experimental work where in many instances to condense means the necessity of cutting into the heart of the paper. Of course, there are some instances of verbose or unwieldy papers where condensing would be essential, even were plenty of space available.

To the credit of the members of the Association be it said that in the majority of instances, the requests of the publication committee have been met with good tempered appreciation of the necessities of the occasion.

It should be bourne in mind, however, by those who attend the Association meetings regularly, that about five-sixths of the members cannot attend its meetings and that aside from the prestige of belonging to the Association, the only return such members secure for their member-

ship fee lies in the publications of the Association. If papers are abstracted (and in many cases emasculated) from force of sheer necessity, such members no longer get an adequate return for their outlay unless the stimulating effect of connection with technical committee work may in some few cases repay them.

To solve this publication problem, you must solve the question of finances, for as in other lines of activity, with sufficient money, you can carry out any policy you may choose.

The income of the Association can be increased in a number of ways.

1. By donations or bequests.
2. By reducing expenses.
3. By collecting a greater percentage of fees.
4. By increasing the membership fee.
5. By increasing the membership.

1. To the writer's knowledge, up to the present year, no effort has been exerted to call the attention of those philanthropically inclined to the noble work of the Association. The result has been that with the exception of a few closely in touch with the Association, no such financial aid has been secured. The Executive Committee last year appointed a sub-committee to take up this question and you will hear their report at this meeting.

2. A reduction of the present expenses of the Association can probably be accomplished only at a sacrifice.

3. How shall we collect a greater percentage of fees? According to the statement of the Treasurer last year, there appears to be nearly as many members dropped each year for non-payment of dues for three years, as there are new members added. This means that the growth of the Association while constant has been very slow. Leaving out of consideration those persons local to the places of

meeting who join with us for the meeting only, the reason for such lapses may be attributed to one of several causes. If the member is a political appointee having no deep seated knowledge or interest in public hygiene, he will naturally lose his interest and drop his membership at the end of his term of office. If on the other hand, the party lapsing is still in public health lines, it may mean that the work of the Association has not interested him,—for we can hardly ascribe many lapses to the cost of membership. Could not the lapses of this second class be greatly lessened by a proper "following up" system such as is used in commercial establishments? Would not a personal letter from a properly authorized official serve to cut down the number of such losses, or at the very least bring out the cause of the lapse? In those cases where it is due to sheer forgetfulness, as perhaps is too often the case, would not a member be saved to the Association?

4. If we increase the membership fee we stand the chance of so reducing the number of present and prospective members that the total income of the Association will not benefit much thereby.

5. This brings us to the question of *Increase of Membership.*

It stands to reason that the expenses of the Association do not increase anywhere near in proportion to the increase in the membership. One thousand copies of programs, of lists of members, or of the papers and transactions can be published at a very slight increase over the cost of six hundred. If the present membership were largely augmented the resulting increase in receipts would be for the most part, to use the vernacular, "velvet." Certain of the officers and some individual members have, it is true, spent time thought and energy on the membership question without this being a specific part of their duties,

but to the writer's knowledge no *concerted* effort has been made in recent years by the general Association to increase its membership. To be sure the sections have taken some steps in this direction and the Section of Municipal Health Officers of whose membership committee one of our genial hosts, Dr. Levy, is chairman, has endeavored to bring in a fair proportion of the vast number of Municipal Health men.

There are a tremendous number of men in public health work to-day who are not connected with this Association. Among the State Boards of Health there are quite a number, particularly in the West, which are not represented at all, while the number of city boards not represented is legion. Political appointees holding office for but a short time are of course hopeless, but there are many earnest workers not in this class who might be secured with a little urging.

Under the old Constitution, the names of proposed new members went to the Executive Committee direct. Under the new Constitution these names will be acted upon by the Membership Committee. Should not this committee also take upon itself the duty of outlining and carrying out a campaign for new members. With the exception of one man, the present membership committee has not done this. That there is no animosity in this statement may be inferred from the fact that the writer is a member of the present membership committee of the Association. While each member of the committee has probably endeavored to do something each has undoubtedly felt the lack of concerted effort. There are several ways in which the membership of the Association may be increased. The circular letter has been tried out to some extent by the Municipal Health Officers Section, and we shall have an opportunity this year of judging the result. If it has proved a success, more money spent along this line would prove a good investment.

Would the reduction of dues to associate members, say to $3.00, have any effect in securing new members? If so,

the active membership list would be sufficiently guarded by the present requirements of five years' consecutive membership.

Once new members are secured, their interest should not be allowed to flag. There are many problems to be studied which belong properly to the Association. If the Association does not undertake them, others less qualified will. For example,—the recent movement for a national department of health originated with the American Association for the Advancement of Science and has been pushed by an organization composed largely of the laity. How much was the committee appointed at Mexico by this Association able to accomplish on this question?

If I am not mistaken, the cause for the above lies partly in our lack in the last few years, of a constitution suited to present needs, partly to inertia, to the busy lives we lead, and to some extent to the inability of the members of important committees to get together to transact business during the interim between meetings. There are but few drones among us. Most of the members are extremely busy men and are often confronted with the proposition of making two dollars do the work of one because the people in general have not awakened to the realization that their lives are worth as much or more than their live stock, or their other personal property. To attend properly to the interim committee work of the Association, the members must either give freely of their hours of rest or take time from their hours of work. Naturally the committee work often drifts until the convenient time which seldom comes. Perhaps also, another reason lies in the necessity of placing clerical work incidental to the work of committees on a clerical force already over-busy.

The obvious ideal remedy for the situation is the establishment of a central headquarters with an executive head whose duty it would be to see that the various committee activities of the Association were attended to at the

proper time,—to spur committees into action; to superintend the vast amount of work incidental to preparing papers for publication, and to do such other work not specifically the duty of the officers, as might naturally fall to it. Such a headquarters with its clerical staff might readily take over the clerical work of the various committees and act as a general clearing house for Association work. Such a scheme is of course chimerical until the revenues of the Association are considerabiy increased, which brings us back to the necessity of increasing our membership.

That the public is waking up to the importance of public hygiene and that funds are forthcoming if energies are bent in the right direction, is well shown by the activities of the American Health League with its reputed income of $10,000. That this League made up as it is for the most part of amateur hygienists and the laity has accomplished something by their propoganda cannot be gainsaid. That the work might more properly have been done by our Association is also evident.

To summarize, there is much work of importance for the Association to undertake. With sufficient money, our publication difficulties would vanish. The trouble lies almost completely in the lack of funds, and the lack of funds is apparently due to a lack of concerted effort for an increased membership.

B. R. RICKARDS.

PUBLIC LABORATORIES VERSUS PRIVATE LABORATORIES.

The *American Journal of Public Hygiene* has been requested to discuss editorially "To what extent and in what respects would a State or Municipal Laboratory be justified in taking work in clinical or diagnostic fields away from a private laboratory by offering to do it without charge?"

While this question undoubtedly originated from an actual situation confronting its propounder, a situation concerning which we are absolutely in ignorance, the question has a broad significance and we shall attempt to define certain factors in arriving at a correct solution, inviting correspondence* from all interested. Later we shall attempt to formulate from these answers what may appear to be the concensus of views. Meantime a tentative answer which in our judgment meets the immediate needs of discrimination, daily arising in every public health laboratory in the country, as to whether or not specific work offered or contemplated is properly the work of that laboratory or should be left to private effort, may be stated as follows:

A State Laboratory (using State to mean any government, Federal, State or Municipal) is paid for by the taxpayers. Hence it should do only such work as is of interest or value to all — or at least to the majority — of the taxpayers, such work at present occupying the field chiefly of the transmissible diseases. So long as the demand for analyses outside of this field comes from a small minority of the citizens, it will remain unjust to

---

Dr. H. W. Hill, University of Minnesota, Minneapolis.

make all pay for what only a few want. This is the field represented by examinations or analyses of personal benefit to the recipient alone, and such should at present be done by the private laboratory.

To illustrate—an examination of sore throats, to determine if diphtheritic or not, is of interest and importance to every taxpayer in the community, for the results afford him protection—indicate where the machinery of protection should act and guide it in its course. But the determination of the presence or absence of sugar in a given urine is not yet considered as of interest to the community but merely to the individual concerned. No official action hinges on the results, and the community does not secure any return (certainly no immediate and direct return) from the result, as it does in the case of diphtheria.

Again, and for the same reasons, analyses of public water supplies are properly State matters, if the taxpayers have provided facilities for making them, but analyses of private wells (so long as the demand for them is small and scattered) are not State matters.

There seem to be two paths, following either of which may justify the State in assuming even matters of apparently purely individual interest as their proper function. The first and simplest path would be that which leads to a universal (or majority) demand that the State assume such. So long as the taxpayers are willing to pay, they are entitled to buy—and they can buy analyses as well as anything else. The second path is that along which it sometimes seems the State is progressing fast—pushed, rather than by its own volition—the path which leads to the consideration of every detail of the individual's welfare as the concern of the State. We assume now that the material injury and fear of death with which a diphtheria case menaces its associates is reason enough to assume State control of that case—and the State does not confine itself merely to the interests of those still well, by merely pre-

venting further spread, but properly enough, especially of late years, regards even the sick as still continuing citizens—still forming a member of the body which has paid for protection from this disease—and furnishes free treatment, or treatment at cost, as well as free supervision. It would not be a far cry for the State to regard diabetes as a matter not wholly personal to the individual suffering from it; to regard the injury to the State through the loss of services and possible death, preceded by privation or even dependency, of the diabetes patient as somewhat akin in effect, although not in kind to the injury done by the diphtheria case. The individual treatment of a diphtheria case by the State for the good of the patient as distinguished from supervision for the good of the public, is not in essence a totally different matter from the treatment of a diabetes patient for his own good.

It would appear then that the existing status differentiates or should differentiate the field of the State laboratory from that of the private on the basis that the man who ges the free examination as a tax payer and the man who gets the paid examination as a private individual should each receive neither more nor less than what he pays for. The status as it probably will be, if we foresee correctly the trend of events, is that the taxpayer will ultimately pay for all and should then receive all.

H. W. HILL.

ED. NOTE.—Doubtless a great deal of interest may be said on this subject, and the Journal believes that much of value for publication will appear in the course of the discussion which this editorial invites.

THE PREVENTION OF INFANT MORTALITY.

One of the most encouraging signs of the times is the growing recognition of the importance of the campaign against Infant Mortality. If one compares the statistics for various preventable causes of death it is clear that nowhere, not even in the case of tuberculosis, is there a needless waste of life of such numerical importance as that due to the deaths of children under one year of age. Fully half of the waste is certainly preventable, which means between 100,000 and 200,000 lives each year in the United States. Yet the work of life-saving among infants has lagged far behind other branches of sanitary work. The American Academy of Medicine did good service in calling a special conference at New Haven on November 11 and 12, to consider these matters and to urge them upon sanitarians and upon the public.

The Conference on the Prevention of Infant Mortality was divided into four sessions, dealing respectively with Medical, Philanthropic, Institutional and Educational prevention. At the first session, under the chairmanship of Dr. J. H. Mason Knox, Jr., of Johns Hopkins, the specific causes of infant mortality were discussed, including alcoholism (by the chairman), tuberculosis, syphilis (Dr. R. A. Urquhart), improper diet (Dr. J. P. Crozier Griffith) and the factory labor of women. Prof. v. Pirquet, recently called from Vienna to Johns Hopkins, was the speaker on tuberculosis; and his coming to this country must be noted as an event of promise for medical research.

The second session, on philanthropic prevention, was opened by Mr. Edward T. Devine, of the Charity Organization Society of New York, with a valuable statistical

study of the waste of infant life and of its causes. He pointed out that while the infant death rate in New York has decreased faster than the general death rate, this is in part due to changes in racial composition and racial habits, rather than to sanitary progress. Mr. Robert W. Bruère of the Association for Improving the Condition of the Poor, gave a graphic account of the splendid work done by philanthropic agencies for the prevention of infant mortality in the city of New York, and Mr. Sherman C. Kingsley made a similar encouraging report for Chicago. One of the most striking points about this discussion was the unanimity of opinion as to the one method by which the problem is to be attacked. The education of the mother to nurse her own child was the keynote of each paper; and it was urged that the success of a milk depot should be measured, not by the amount of milk distributed, but by the number of nursing mothers whom it trains. The ignorance of the mother in the care and feeding of the infant is the chief cause of the waste of infant life; altho behind this, as several speakers pointed out, lie economic conditions which keep a large class of the population in such poverty that both intelligence and sanitation are impossible.

At the third session, on Institutional prevention, Mr. Homer Folks, of the New York State Charities Aid Association, presided. The weakness of institutional care and the importance of keeping babies with their mothers or of placing them out in the country was again strongly emphasized by Dr. C. P. Putnam of Boston, Dr. E. L. Coolidge of New York, and others.

The final session, under the chairmanship of the writer, was devoted to Educational Prevention, altho it will have been noted that the two previous sessions were also largely concerned with educational problems. Dr. Thomas Darlington described the Division of Child Hygiene recently established by the board of health of New York

City to correlate all activities relating to child health and including a corps of visiting nurses to give direct instruction in the care of children in the individual home as soon as possible after a birth is reported. It was made clear in the discussion that this system, carried out with such success at St. Pancras and Huddersfield and other English towns, may well form an important part of the work of the local board of health. Going back of the child already born, the question of Who should and should not be Parents was then discussed, Prof. C. B. Davenport of Cold Spring Harbor, outlining some of the hereditary laws which underlie man-breeding and Professor Keller of Yale University pointing out the practical limits to Eugenics which are set by public opinion. Finally, Professor John M. Tyler of Amherst and Professor W. T. Sedgwick of the Massachusetts Institute of Technology, spoke on The Education of the Parents of the Future. All progress in special sanitary education depends upon the receptive viewpoint of the public. Sound, popular education in biology and hygiene and sanitation in the public schools is the foundation upon which we must build if we are to build solidly and well. Yet this central problem of elementary education has been less efficiently handled than any other. The time is ripe for a general movement for the improvement and development of elementary instruction in these vital matters,—instruction which shall be sane and practical and well-proportioned, and which shall really help the child to lead a clean and healthy life.

The main lesson of the Congress was that there is a tremendous needless waste of infant life, waste so tremendous and so needless as to demand the attention of the sanitarian, perhaps more urgently than any other aspect of preventable disease. This waste can largely be stopped by the education of the mother in the care of her child and particularly in the importance of breast feeding, which is far more generally possible than is commonly supposed.

This educational work can be carried forward with excellent results by medical and philanthropic agencies of various sorts; but the one agency which can meet the problem in a comprehensive way,—the one agency to which the work really belongs,—is the town or city board of health. Is there any activity of the local board in which a hundred dollars will save as many lives as in this sort of educational campaign? Is there not here a splendid but neglected opportunity for many a health officer?

C.-E. A. WINSLOW.

SPECIAL ARTICLE.

SANITARY SUPERVISION OF COMMUNICABLE DISEASES BY THE DEPARTMENT OF PUBLIC HEALTH.

By Dr. R, G. BRODRICK,
Health Officer, San Francisco, Cal.

The control of Infectious Diseases by sanitary regulations is one of the notable achievements of modern times. It is stated that the death rate during the seventeenth and eighteenth centuries ranged between 50 and 80 per 1000. To-day in such cities as New York, London and Berlin the average is 17 to 19 per 1000; in San Francisco it has been reduced to 13 per 1000. This decrease in mortality is due to the protection from infectious diseases now given to children in the first five years of their lives.

The average duration of life has coincidentally increased. According to Dr. M. Biggs, of the New York City Health Department, the expectation of life in that city in 1866 was a little more than 25 years, while in 1903 it had almost doubled, being about 42 years.

The Department of Public Health exercises sanitary supervision over Cholera, Yellow Fever, Smallpox, Varicella, Pulmonary Tuberculosis, Diphtheria, Membranous Croup, Scarlet Fever, Typhus Fever, Measles, Pneumonia, and every other disease publicly declared to be dangerous to health, by virtue of Ordinance 1034. Typhoid Fever, Bubonic Plague, Cerebro-Spinal Meningitis, Glanders,

Anthrax, Leprosy, Beri Beri, Erysipelas, Trachoma, Pertussis and Mumps have been publicly declared to be reportable diseases. Communicable Diseases are reported by physicians to the Health Office thru one of the following channels:

1. By mail — printed postal cards giving lists of reportable diseases are furnished upon application.

2. By telephone — an operator is maintained day and night at the Health Office.

3. By certificate of death — this is not accepted as complying with the law regulating the reporting of communicable diseases unless death ensued within 24 hours after the physician first saw the case.

Other sources of information are:

1. Hospitals.

2. Institutions having charge of children, such as Schools and Orphan Asylums.

3. Charitable Organizations, for example, the Associated Charities and more especially the Association for the Study and Prevention of Tuberculosis.

4. By notification from the Medical School Inspectors. Cases occasionally first come to our attention when application is made to the Health Office that permission be granted a child to return to school, as is required by Section 17, of Ordinance 1034.

An alphabetical "name" index is kept of all physicians who fail to report their contagious diseases. Upon the first offence a letter is sent to the physician giving the patient's name and address and the nature of the disease informing him that it is a reportable disease and requesting

his co-operation in the future. A second offence calls forth a letter citing the physician to appear at the Health Office and show cause why action should not be taken against him. This is usually sufficient. The Department has been loath to prosecute physicians who fail to report contagious diseases believing that such failure is due to thoughtlessness; but that more good may be accomplished by first impressing upon them the importance of strictly observing the law. In a few instances where neglect to report contagious diseases has led to serious consequences, the offending physicians have been arrested.

Upon receiving information of the existence of a contagious disease from whatever source, search is first made in the Index and if it has not been previously reported a "Record" card is made on which all essential facts, name, age, address, date and source of report are entered and to which are later added every recommendation and official action of the Department, such as reports of sanitary inspectors, names of contacts, findings of Bacteriologist, report of Fumigator, etc.

The "Record" cards are differently colored in each disease, e. g., yellow for Variola; red for Scarlet Fever; blue for Diphtheria; and are filed for four years when they are destroyed.

A duplicate of the "Record" card is furnished the Sanitary Inspector, who is a physician, and he thereupon visits the premises where he verifies the information furnished him, obtains list of contacts, location of school attended by children in family, address of depot supplying milk. Information is given regarding the nature of the disease and precautions to be taken to prevent its spread, a printed form covering these points being left on the premises if considered necessary. The Sanitary Inspector does not see the patient unless specially requested to do so. In case of Scarlet Fever, Diphtheria and Small-pox a placard with the name of the disease is placed on the premises

which notifies the public to keep out. The Principal is furnished with the names of contacts by the Sanitary Inspector and notified to exclude them from attendance in public, private or parochial schools until a permit to return is obtained from the Health Office. Notice is further sent to the milk dealer informing him of the existence of a contagious disease and ordering him to pour milk into a container furnished by the family, or should bottles be left, not to remove same until after fumigation.

The Sanitary Inspector later calls to ascertain if any contacts have sickened and unless previously notified, the Sanitary Clerk telephones to the attending physician one or two days before fumigation to be sure that the patient has recovered. If so, the Sanitary Inspector visits the premises, determines the number of infected rooms with cubic air space. This information is sent to the Disinfector who on the morning following proceeds with gummed strips, formalin lamps or sulphur pots to fumigate the rooms, the amount of material used being included in his report. To test the efficacy of the work a Petrie Dish containing a non-pathogenic organism is uncovered in the infected space and the doors are sealed on the outside. In six or eight hours a Sanitary Inspector calls, breaks the door-seal, takes charge of the Petrie Dish which is sent to the Bacteriologist for examination. In case of positive findings fumigation is repeated.

Time will not permit considering more than a few of the important communicable diseases and I will therefore commence with

DIPHTHERIA.

The decrease of over 37 per cent. in death rate is due in part to the greater number of cases reported; in part to the distribution of free antitoxin. A prompt report of this disease must be made as soon as discovered. This may be done on the printed slip accompanying the sterile

swabs to be obtained at various drug-stores throughout the City, and after inoculation sent to the Health Office at any hour. Examination of the cultures are made at 9 A. M. and at 6 P. M., and the results are immediately telephoned to the attending physicians, written reports following.

Free antitoxin is furnished upon certification from the attending physician that the family is unable to pay for it.

When Diphtheria Bacilli are found in the culture a Sanitary Inspector visits the premises and sees that the patient is properly isolated. No work of any kind, such as, tailoring, laundering, or manufacture of food stuffs is permitted in the rooms occupied by the family, and a case occurring in the rear of a store must be removed to a hospital or the store will be closed and placarded. Isolation is maintained until a culture has shown that the Diphtheria Bacilli are no longer present, but under no circumstances is isolation discontinued until ten days after the beginning of the illness.

Cultures should be sent to the Health Office at least once each week, even oftener at the latter period of the disease, so that the hardship of isolation and of school exclusion might be reduced to the minimum.

Should the Diphtheria Bacillus persist in a patient's throat for three weeks, the organism is isolated and two guinea-pigs are inoculated with a forty-eight hour bullion culture. If the pigs live one week isolation is discontinued. If they die, the test is repeated in two weeks.

TYPHOID FEVER.

An epidemic of Typhoid Fever at the present time is inexcusable and is the nemesis visited upon a community because of carelessness in the conservation of the purity of its water, milk or food supply. Flies are probably the carriers of the disease in isolated cases, whereas water or milk are the more probable vehicles in epidemics.

The adoption of an ordinance requiring all markets, fruit and vegetable stores, restaurants and bakeries to be screened with fine wire mesh, the passage of the law requiring that manure be kept in metal-lined covered bins built within the confines of stables, and the enforcement of anti-plague measures have been important factors in producing the comparatively low typhoid rate in this City, but 16 deaths having so far occurred during the present year.

Samples are collected twice a month from the distributing reservoirs of the Spring Valley Water Co. and have invariably been free from contamination. The spring and well waters of certain dairies on the peninsula have been found to contain the bacillus coli communis; and the owners were notified, under penalty of forfeiture of the permit to sell milk, to discontinue their use. The Chief Dairy Inspector in all cases endeavors to locate the source of contamination and gives the necessary orders to remove it.

Outfits, consisting of ½ dram Shell vial and lancet, are now distributed to various drug-stores where they may be obtained by physicians. A 1 to 50 dilution of the serum is used in making the test, and if paralysis and clumping do not occur in one hour, a negative result is reported.

Upon notification of a typhoid case, a Sanitary Inspector visits the premises, ascertains duration of illness, source of water and of milk supply, if there were a history of infection after eating shell-fish, uncooked vegetables or fresh fruit. He investigates if an open sewer, vault toilet, open manure bin or undrained stable exists in the neighborhood. He inquires from the attending physician if the diagnosis has been verified by a Widal examination and if the urine shows Diazo Reaction.

No placard is placed on the premises, but the Sanitary Inspector sees that the patient is isolated in a room properly screened and that the execreta, bed-clothing and other

articles coming in contact with the patient are immediately and thoroughly disinfected. The Danger of Infection from Typhoid carriers, especially when engaged in the preparation of food or in dairy work should be borne in mind. This occurs in about 4 per cent. of cases, the Bacillus Typhosus apparently being harbored in the bile and intermittently execreted with the fæces.

Public safety requires that persons recovering from Typhoid Fever should be kept under bacteriologic control until they are no longer a menace to health.

VARIOLA.

During the past year occurred 171 cases of Small-pox with one death, whereas the year previous there were 249 cases with four deaths. This decrease, due to the strict enforcement of the compulsory vaccination law among school children, proves the same to be not only justifiable but a beneficient exercise of police power over the public health.

During the month of April 1908, following an outbreak of Small-pox in the Mission, Dr. A. A. O'Neill, Chief Surgeon of the Isolation Hospital, was detailed to examine the children attending schools in that District and found 66 per cent. had no vaccination, altho every child had presented a vaccination certificate duly signed by a physician.

Last October, Dr. Bricca, Medical Inspector of Schools, found 11 cases of Variola in a class-room of the Garfield Primary School which is situated in the Latin Quarter, eight of whom had presented certificates of vaccination. Before we were able to stamp out this endemic, 29 cases had occurred among the school children, although the disease did not attack the Italian parents, all of whom, thanks to the vigilance of the Immigration authorities, showed good vaccination scars.

At the request of the Health Department, the Board of

Education has adopted a new form of vaccination certificate, which requires the physician to certify that he examined the child 14 days after vaccination and that the same is successful. Out of an enrollment of 10300 children in 19 schools under Medical Inspection all but 131 have been successfully vaccinated.

When a case of Variola or of Varicella is reported to the Health Office, its Diagnostician, the Chief Surgeon of the Isolation Hospital, is at once notified by telephone; and he investigates the case. Upon establishing the diagnosis as Small-pox, the patient is removed to the Small-pox Department which is now the equal of any place of its kind and where the patient is given the same attendance as might be obtained in any first-class institution. Removal to the Small-pox Hospital is made without regard to the stage of the disease. Every effort is made by the Diagnostician to locate the source of infection. He visits each room in the house and obtains the names, places of residence and business addresses of all contacts and forwards the same to the Sanitary Inspector who thereupon vaccinates them and subsequently visits them every five days for fifteen days. The house holders in the same block are advised of the necessity of vaccination. When cases of doubtful diagnosis occur especially in rooming houses or hotels, large stores or factories, the public interest demands that the "suspect" be removed to the Small-pox Hospital, where under the present arrangement he is completely isolated from those having the disease until such time as a positive diagnosis is made.

It is advised that physicians when in doubt report the case as "suspicious" for among the diseases which have been reported as Small-pox are Measles, Scarletina, Varicella, Syphilis, erythema, multiforma-bullosa, drug eruptions, urticaria, and the various forms of acne.

The Small-pox dead are buried direct from the morgue in sealed zinc lined coffins.

TUBERCULOSIS.

So far the fight against Tuberculosis has been largely conducted by private charity, the municipality being loath to assume the responsibility. The misery, poverty and crime caused by nearly 2000 deaths from Tuberculosis in this City since the fire cannot be over-estimated. Strong efforts are being made in other cities to control this disease; a reduction of 70 per cent. in death rate in the Boroughs of Manhattan and Bronx having been made in 20 years, and it is time that San Francisco whose annual average death rate from Tuberculosis is the greatest of the ten largest American cities acts in defence of the lives of its citizens.

All cases of Pulmonary Tuberculosis are required to be registered at the Health Office, which may be done by postal card or by forwarding a specimen of sputum for examination when such shows tubercle bacilli.

Wooden asphalt lined boxes with blank forms pasted on covers may be obtained without charge at any of the drug stores now used as stations. A report of the examination is telephoned to the attending physician.

The information obtained is for record only, and in no instance are visits made by Sanitary Inspectors unless requested by the visiting physician. Hospitals, Sanatoria and other Institutions are required, when reporting, to give the previous address of the patient.

After removal or death the rooms are fumigated. If renovation is necessary, the owner is notified and in case of non-compliance the premises are declared a nuisance by the Board of Health and vacated until placed in sanitary condition. An ordinance following the lines of the proposed statute recently vetoed by the Governor clearly defining the powers of the Board of Health is now being framed. Indigents requiring hospital care are sent to the Tubercular Wards of the City and County Hospital, there

being accommodations for 118 males and for 13 females. Every effort is made as far as possible to give these patients the benefits of fresh air and abundance of food; and a special Interne is to be assigned as soon as one can be obtained who will supervise the handling of tubercular cases. While most of the cases are incurable, many have been benefitted and upon leaving the Hospital are referred to the Anti-Tuberulosis Society.

To perform the work properly a staff of medical inspectors and visiting nurses is essential. During the past few months the Society for the Study and Prevention of Tuberculosis appointed three nurses whose efforts have been of the greatest value in relieving the sick poor as well as preventing spread of the disease. This work should properly be done by the Health Department whose nurses should visit all indigent cases, report those having no visiting physician to a Medical Inspector who should follow up these cases as well as those discharged from public institutions. A law should be enacted permitting forcible removal of a tubercular person, when necessary; — such as exists in New York and Massachusetts.

AMERICAN PUBLIC HEALTH ASSOCIATION

THE RESULTS OF THE FEDERAL CONTROL OF THE MANUFACTURE OF VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS.*

By Dr. JOHN F. ANDERSON

Past Assistant Surgeon and Director Hygienic Laboratory, U. S. Public Health and Marine Hospital Service, Washington, D. C.

The Act of Congress approved July 1, 1902, regulating the manufacture and interstate sale of viruses, serums, toxins, and analogous products has now been in operation about seven years. This supervision and control was vested by the Act above referred to in the Secretary of the Treasury through the Public Health and Marine-Hospital Service.

Some of the products controlled by this law, such as vaccine virus and diphtheria antitoxin, are an important part of the armamentarium of health officers in their fight to control contagious diseases and I think they, as well as the practicing physicians, will be interested to know what have been the practical results of the Federal control of these products.

Previous to the passage of this Act there was no supervision over the manufacture of these products; each manufacturer had his own standard, units of potency, etc., arbitrary or otherwise, guided only by the effect on his

*Read at the meeting of the American Public Health Association at Richmond, October, 1909.

business of putting out a product inferior, when it could be determined, to his competitors.

Prior to 1902 a "sore arm" was a very frequent accompaniment of a successful vaccination, due largely, in my opinion, to the very high bacterial contamination of vaccine virus with streptococci and staphylococci. Also prior to 1902 tetanus spores had been found by different workers in vaccine virus and deaths from tetanus had been attributed to contaminated virus.

While a few of the manufacturers used the Ehrlich standard unit for diphtheria antitoxin most of them measured the strength of their serum, where done at all, by its neutralizing action on 100 M. L. D. of diphtheria toxin, a most inaccurate method.

Each manufacturer of tetanus antitoxin had his own standard and each was different from the other.

For the other products, such as antistreptococcic and other serums, tuberculin, etc., for which there are no standards, and also for diphtheria and tetanus antitoxins, there was no limit to the amount of preservative used and little regard paid to the decrease in potency incident to age.

Some of the laboratories were inadequate in equipment and methods for the safe production of these therapeutic agents, and the stables and barns were such that about half of the firms licensed at the first inspection had to build new ones to comply with the regulations.

Such, in brief, is a summary of the conditions before the enforcement of the Act referred to. Let us now see what are the conditions at the present time.

Without exception, every licensed firm has made extensive improvements in its laboratory buildings, equipment, methods of production and potency of their products. Very important among these improvements has been either the building of separate laboratories for work with such infections as tetanus and tuberculosis or provision in the main laboratory for the complete separation of work of this

kind from that done with diphtheria antitoxin and vaccine virus.

Many have made radical improvements in their barns and stables; others, where the barns were located in the city, have erected new ones in the country.

There has been a marked improvement in the purity of vaccine virus as now produced over that prior to 1902.

In a paper read before the American Public Health Association in 1905* I showed that the average number of bacteria per tube in glycerinated vaccine examined in the Hygienic Laboratory prior to 1902 was 4,698; the average examined for the three subsequent years was only 309, or an improvement of 93.4 per cent.

It is now very exceptional to find streptococci in vaccine. Of the many hundreds of vaccines specially examined since 1902 for tetanus spores, we have never succeeded in finding them in a single instance.

"Sore arms" following vaccination are now exceptional and are usually due to improper vaccination rather than to the vaccine used. By regulation, the interstate sale of the old style "dry" lymph point has been prohibited. The "dry" point, while convenient and much liked, especially by some of the older physicians, was always richer in bacterial contamination than the glycerinated product.

All virus is now required by the regulations to be dated, showing the date on which it should be exchanged for fresh virus, and each lot is required to be examined for tetanus and detailed records kept of such examinations.

Vaccine virus is bought on the open market at frequent intervals and examined in the Hygienic Laboratory for the number of bacteria, the kind of bacteria, its potency, correct labeling, and a special examination is made for the tetanus bacillus.

The practice that some manufacturers had of renting

*Anderson, John F.: Federal control of vaccine virus. Reports Am. Pub. Health Assn., vol. 30, 1905, p. 201.

calves to be used for the production of vaccine virus is no longer allowed. All animals are required to be killed immediately after the vaccine virus is taken and a careful post mortem made. Detailed records of the autopsy, if pathological changes are found, are to be kept. No virus may be marketed from an animal suffering from a communicable disease other than vaccinia.

Previous to April 1st, 1905, there was no official standard in the United States for measuring the strength of diphtheria antitoxin. On that date, the standard unit made in the Hygienic Laboratory was adopted and all licensed manufacturers were required to standardize their diphtheria antitoxin therewith. The unit is sent bimonthly to the various establishments making diphtheria antitoxin.

Prior to the promulgation of this unit the user of diphtheria antitoxin had no assurance that a package of serum contained the number of units labeled; but now he can feel satisfied that it contains at least the number labeled.

All serums are required to be labeled, showing the date beyond which they cannot be expected to yield their specific results.

Diphtheria antitoxin is bought on the open market at frequent intervals and forwarded to the Hygienic Laboratory for examination. It is examined there for correct labeling, which includes the manufacturer's licence number, the number of units in the package and return date; for potency, or whether the package contains the number of units labeled, and a surplus to allow for deterioration by age; for the amount of preservative, which in the case of trikresol or phenol is not allowed to exceed a certain amount; for bacterial or toxic contamination, especially tetanus toxin. If found deficient in any of these particulars the matter is reported to the Surgeon-General of the Public Health and Marine-Hospital Service for appropriate action.

Since the concentration of diphtheria antitoxin has come

into such general use, sera concentrated by the so-called Gibson method or modifications, in addition to the usual examination are examined for the amount of ammonium sulphate or magnesium sulphate and, in some cases, for total solids. This last is not a minor point for in the effort to obtain a high concentration the total solids have been greatly increased and such solutions are probably not readily absorbed.

As a result of the establishment of a standard by the U. S. Public Health and Marine-Hospital Service antidiphtheric serum was admitted to the Pharmacopoeia in the 8th Decennial revision.

Before the adoption of the standard American unit for tetanus antitoxin on October 25, 1907, by the U. S. Public Health and Marine-Hospital Service, there were as many different units or standards as there were producers of tetanus antitoxin. The physician, in using this serum, could have no accurate idea of the number of antitoxic units the serum contained, as one maker's product was labeled "to contain 6,000,000 units per c. c." and another maker's "to contain 0.75 unit per c. c.," when in fact the first, according to the official standard, had only 90 units per cubic centimeter while the latter contained about 770.

The unit may be defined as follows: "The immunity unit for measuring the strength of tetanus antitoxin shall be ten times the least quantity of antitetanic serum necessary to save the life of a 350-gram guinea pig for 96 hours against the official test dose of a standard toxin furnished by the Hygienic Laboratory of the U. S. Public Health and Marine-Hospital Service."

As a prophylactic the dose is 1,500 units.

There is no Federal control over the manufacture of veterinary sera. Several different makes of veterinary tetanus antitoxin were examined in the Hygienic Laboratory and most of them were found to contain less than 25 units per c. c., while the minimum strength of the tetanus

antitoxin for human use—over which there is an efficient Federal control—is at least 150 units per c. c. and most of it is considerably stronger.

Tetanus antitoxin is bought on the open market and examined in the Hygienic Laboratory as detailed above in regard to diphtheria antitoxin.

One very important result of the establishment of the standard will be that physicians using tetanus antitoxin in the future will be able to give definite amounts of antitoxin and in this way valuable data will be collected as to the number of units necessary for prophylactic and curative purposes.

Other sera for which there are no standards or acceptable methods of determining their potency, such as antidysenteric, antistreptococcic, antipneumococcic, etc., are only examined for sterility, amount of preservative, and correct labeling. The same is true of tuberculin, bacterial vaccines, etc.

There has been much time and work devoted to an effort by the Hygienic Laboratory to discover a method of standardizing tuberculin, but without practical results up to the present.

The Surgeon-General has informed all state and municipal health officers that the facilities of the Hygienic Laboratory are at their disposal for the examination of diphtheria and tetanus antitoxins when for any reason it is desired by them to know the potency of the serum distributed by these health agencies. A number have sent samples to the laboratory for examination and report on the same. In a few instances it was found that the board of health serums barely contained the amount labeled.

Since it has become known that these examinations are made, very few shortages have been found. It would be much to the advantage of the health boards if more samples were sent to the laboratory for examination.

Aside from the administrative part, which is managed

by the Surgeon-General of the Public Health and Marine-Hospital Service, many of the important details in enforcing this law have been based on research work done in the Hygienic Laboratory.

The standard unit for diphtheria antitoxin* was worked out in the Hygienic Laboratory and is issued bi-monthly from the laboratory to makers of diphtheria antitoxin. The preparation of this standard and the standard method of testing diphtheria antitoxin are described in Hygienic Laboratory bulletin No. 21.

The standardization of tetanus antitoxin† is described in bulletin No. 43 of the Hygienic Laboratory. These two bulletins are now accepted as containing standard methods for determining the strength of these two sera and are constantly used by all manufacturers.

Other work of importance done in the laboratory in connection with these products is the question of the influence of age and temperature upon the keeping qualities of diphtheria antitoxin. Based on this work, regulations in regard to the dating of serum will probably be made.

The question of the influence of concentration of sera upon their absorption has been studied.

Efforts are being made to discover a method of standardizing tuberculin.

The work in the laboratory upon anaphylaxis has thrown much light upon the untoward results that sometimes follow the administration of sera and have given us our first knowledge of the cause of those unfortunate accidents. Studies upon this problem are still being made in the hope that some way may be found to avoid them.

Many manufacturers have availed themselves of the

---

*Rosenau, M. J.: The immunity unit for measuring the strength of diphtheria antitoxin (based on Ehrlich's normal serum). Official standard prepared under the Act approved July 1, 1902. Hyg. Lab. Bull. No. 21, U. S. Pub. Health & Mar.-Hosp. Serv., Wash., 1905, 92 p.

†Rosenau, M. J., & Anderson, John F.: The standardization of tetanus antitoxin. Hyg. Lab. Bull. No. 43, U. S. Pub. Health & Mar.-Hosp. Serv., Wash., 1908, 59 p.

privilege of sending their scientific men to the laboratory to be instructed in the methods of testing sera in use in the laboratory, and frequently call upon the laboratory for advice in regard to the various technical matters connected with the production of these products.

It might be of interest to you to know how this control over the production of these products is exercised by the Public Health and Marine-Hospital Service. In accordance with the Act of Congress approved July 1, 1902, and the regulations framed thereunder, all persons or establishments engaged in the manufacture and interstate sale of viruses, serums, toxins and analogous products are required to be licensed by the Secretary of the Treasury upon the recommendation of the Surgeon-General, after a sanitary inspection has been made of their establishments, methods, and products.

An inspector visits their establishments and examines carefully the sanitary condition of the buildings, the condition of the animals used for the production of the serum, the technic employed—such as methods of bleeding, collecting and storing the serum, and especially the methods used in measuring the strength of their product. He sees as to the labeling of the product, paying especial attention to the date when the serum is labeled to be exchanged. He also takes samples of their various products, which are forwarded to the Hygienic Laboratory for examination.

Upon the results of the examination of these samples and his inspection of the establishments are based the inspector's recommendation for or against a license for the particular establishment.

After a firm has been licensed to engage in the manufacture and interstate sale of these products, samples of their products are bought at frequent intervals in various parts of the country and examined in the laboratory. The samples are examined, first, as to labeling; second, as to the potency of the product; third, as to sterility and the

presence of toxins; fourth, as to the amount of preservative.

If the samples are found to be deficient in any of the above particulars the matter is at once reported to the Surgeon-General who, in the case of a lack of potency, contamination, or excessive amount of preservative, requires the manufacturer to withdraw from the market that particular lot of serum. This is a comparatively easy matter for manufacturers to do, as they are required to label each lot of serum, etc., with a laboratory number and to keep records to whom the same is sold.

Since April 1, 1905, many samples of serum have been examined in the Hygienic Laboratory, and of this number only a very few have been found to be below strength or to contain a less number of units than labeled, or to have bacterial contamination.

The great advantage of the strict control over these products to the physician, and consequently in the control of the various diseases for which they are used, is of course very manifest.

The great improvement in these products and the method of their production that has been made as a result of the Federal control may be summarized as follows:

(1) All manufacturers have been required to put their stables, barns and laboratories into good sanitary condition, and to keep them so.

(2) When work with tetanus, tuberculosis, etc., is done in laboratories producing diphtheria antitoxin, a complete separation of such work is required.

(3) All establishments are required to be equipped with proper laboratory facilities and personnel to insure the safe and efficient preparation of these products.

(4) Each lot of vaccine virus is required to be examined, bacteriologically, and a special test made for tetanus bacilli, and detailed records kept of such examinations.

(5) The sale of the old style "dry" lymph points is no longer allowed.

(6) All animals used for the propagation of vaccine virus are required to be autopsied and the virus from any animals proved to be suffering from a communicable disease other than vaccinia is not allowed to be sold.

(7) All sera are now required, in addition to tests for potency, where there are standards established, to be examined for and free from bacterial and toxic contaminations; to be correctly labeled; to state the date beyond which they cannot be expected to yield their specific effects; to contain no excessive amount of preservative.

(8) Standards for diphtheria and tetanus antitoxins having been established, physicians have a knowledge of the exact amount of the dose used in each instance.

(9) A standard for tetanus antitoxin having been made, known and comparable amounts of this serum will be used and valuable data gathered as to the amount of tetanus antitoxin needed for prophylactic and curative purposes.

(10) When the physician uses a package of diphtheria or tetanus antitoxin, he may feel assured that every safeguard has been thrown about its production and that it contains at least *the number of units stated on the label.*

THE SCOPE OF PUBLIC HEALTH WORK IN THE PREVENTION OF DEPENDENCE.*

By HOMER FOLKS

Secretary New York State Charities Aid Association

Public health work as now interpreted by public health commissions, boards and departments, state and municipal, includes both the education of the individual and the education of the community. In both cases, the education is with a view to definite and immediate action. It is not education in the abstract, but it is rather an awakening, an exhortation, a propaganda, a crusade, a campaign. The scope of public health work includes getting cities, counties, towns and states, to do those things for the protection of the individual and for the protection of communities which can be done only by governmental action. It means getting local governmental agancies to establish and maintain hospitals, sanatoria, visiting nurses, and other agencies for the prevention of tuberculosis, and for the treatment and prevention of numerous other preventable diseases.

The scope of public health work, thus interpreted and understood, in the prevention of dependency, is beyond the power of any man to define. We know that if public health work as thus outlined can be carried on comprehensively, efficiently, and adequately, to its logical conclusions, the volume of dependence, both public and private, will be enormously reduced. Were I to attempt to say by just how far poorhouses might be abolished, charity societies

*Read at the American Public Health Association at Richmond, Va., October, 1909.

made unnecessary, and charitable workers released for other occupations, by the full performance of public health functions, I should seem, I fear, to be sketching a Utopia, rather than outlining that actual condition which I firmly believe is soon to be brought to pass. Few of us are aware, I think, of the profoundness of the change through which we are passing in our charitable work. We have long studied causes of poverty, sometimes rather academically. The clearer our vision of the causes of poverty has become, the larger ill health has loomed up as a cause. It is not necessary at the moment to consider whether this ill health is due to individual or to social causes, or to what extent it is due to individual causes and to what extent to social causes. Its effect in producing dependence is just as certain in one case as in the other.

It was no accident that the first strong comprehensive movement for the prevention of tuberculosis in New York City was organized by a society directly concerned with the relief of the poor. The connection between poverty and ill health is so direct, so immediate, and so important that the moment any individual or society turns its attention to the causes of poverty, that moment it finds itself in the thick of the public health movement. In the City of New York, the unifying factor in the tuberculosis work is the society which for more than twenty-five years has been engaged in organizing charity; and in the State of New York the unifying factor is a society which for thirty-five years has been engaged in improving the condition of public institutions and the administration of public relief. There could be no stronger proof of the fact that the effort to define the causes of poverty and to control such of them as may be controlled, leads directly and immediately into the field of public health work for the first, most important, and most practicable things to be done.

As to precisely how much dependence in its various forms is due to preventable sickness and death, no one is

able at this time, in my judgment, to make a comprehensive statement. We have isolated facts which are tremendously significant. Recent examination of the health records in one of the cities of New York State of the deceased parents of orphans and half-orphans supported in asylums, revealed the astonishing fact that, so far as the causes of death could be ascertained from the vital statistics (and in most cases they could be) tuberculosis was the cause of fifty-two per cent of the deaths. The number of half-orphans and orphans in institutions in the State of New York is probably between 15,000 and 18,000. Some suggestion as to the possible scope and sweep of public health work and its effects upon dependency may be had in the fact that a successful crusade against tuberculosis would mean, for one thing, a reduction of the census in our institutions for dependent children of from fifteen or eighteen thousand. We have a total institutional population in the State in excess of 100,000. Of all the various classes making up this total, there is probably no class to which tuberculosis fails to contribute its quota. In hospitals and almshouses, as well as in orphan asylums, we find large elements of population which will be removed when this particular campaign or crusade is carried to its logical, legitimate, and inevitable conclusion.

There are other crusades also to be undertaken by public health authorities which will further reduce the volume of public dependence. The movement for the prevention of venereal diseases, from which public health authorities cannot much longer hold aloof, must result ultimately in a great diminution in the demand upon the resources of our hospitals, our children's institutions, our institutions for the blind, and particularly our hospitals for the insane.

Much remains to be done in the prevention of typhoid fever, which in certain localities is a great feeder of orphan asylums. Diphtheria has been brought partly under control, but several chapters remain to be written before that

particular campaign can be said to be closed. Measles, scarlet fever, and whooping cough must be brought under control in the near future. Infant mortality is still conspicuously an evil with which public health authorities must deal. We shall not make permanent headway against alcoholism until we have the significant and progressive support of public health authorities, if, indeed, the later stages of that campaign are not conducted under the leadership of public health authorities.

Speaking as one who has been occupied continuously for sixteen years in promoting wiser administration of charitable agencies, more effective use of charitable funds, and better adjustment of public institutions to the needs of the community, I find myself, with no sharp break so far as I can discover, in the development of my interest, devoting the major part of my time to efforts which but a few years ago seemed to lie wholly outside the field of charitable agencies. In common with a host of other workers, individual and corporate, we are engaged, as we were before, in ascertaining and in restricting the causes of poverty. Our charter requires no change. I am not quite sure that the American Public Health Association and the various state commissions and societies, and municipal health authorities, know quite what to do with these new allies. For good or ill, however, we seem to have come to stay; we wish to help; we wish to work constructively; we wish to supplement and strengthen public health authorities, we do not wish to supplant them nor to be in the way, nor to obscure their claim upon the public for adequate support. We may perhaps be a little awkward in finding our way about at first, but the right hand of fellowship has been held out with such wholehearted goodwill, the needs are so great and so immediate, and the things to do are so evident, that I think neither you nor we will experience much difficulty in working to-

gether harmoniously, nor have I a doubt that the combined strength of the two sets of workers will be vastly more than the sum of the strength of each taken separately.

AMERICAN PUBLIC HEALTH ASSOCIATION.

STANDING COMMITTEES

Executive Committee

*Dr. C. O. Probst, Chairman,	Columbus, Ohio.
*Dr. Charles A. Hodgetts,	Toronto, Ontario.
*Dr. E. C. Levy,	Richmond, Va.
*Dr. Frederico Torralbas,	Havana, Cuba.
*Dr. Wm. C. Woodward,	Washington, D. C.
*Dr. Frank W. Wright,	New Haven, Conn.
*Dr. Wm. R. Stokes, (Chair. Lab. Sec.)	Baltimore, Md.
*Mr. B. R. Rickards (Sec. Lab. Sec.),	Columbus, Ohio.
*Dr. W. H. Guilfoy (Chair. Vital Statistics Sec.),	New York City.
*Dr. Wilmer R. Batt (Sec. Vital Statistics Sec.),	Harrisburg, Pa.
*Dr. S. H. Durgin (Chair. Municipal Health Officers Sec.),	Boston, Mass.
*Dr. E. C. Levy (Sec. Municipal Health Officers Sec.),	Richmond, Va.
James O. Jordan,	Boston, Mass.
Dr. W. A. Evans,	Chicago, Ill.
Dr. A. J. Douglas,	Winnipeg, Manitoba.
Dr. Eugene Buehler,	Indianapolis, Ind.
Dr. Marshall Langton Price,	Baltimore, Md.
Dr. Cressy L. Wilbur,	Washington, D. C.

And ex-presidents ex-officio.

Committee of Seven

Dr. C. O. Probst, Chairman,	Columbus, Ohio.
Dr. Wm. C. Woodward, Sec.,	Washington, D. C.
Dr. Gardner T. Swarts,	Providence, R. I.
Prof. F. C. Robinson,	Brunswick, Maine.
Dr. J. N. Hurty,	Indianapolis, Ind.
Dr. Chas. A. Hodgetts,	Toronto, Ontario.
James O. Jordan,	Boston, Mass.

*Ex-Officio.

Program Committee

Dr. C. O. Probst, Chairman,	Columbus, Ohio.
Dr. Wm. C. Woodward, Sec.,	Washington, D. C.
Dr. John A. Amyot (Chair. Program Com. Lab. Sec.),	Toronto, Ontario.
Dr. Eugene Buehler (Chair. Program Com. Mun. Health Officers Sec.),	Indianapolis, Ind.
Dr. E. C. Levy (Chair. Program Com. Vital Statistics Sec.),	Richmond, Va.
Dr. H. W. Hill,	Minneapolis, Minn.
Dr. H. D. Pease,	New York City.

Publication Committee

Dr. Wm. C. Woodward, Chair.,	Washington, D. C.
Dr. H. D. Pease (Chair. Pub. Com. Lab. Sec.),	New York City.
Dr. C. V. Chapin Chair. Pub. Com. Mun. Health Officers Sec.),	Providence, R. I.
Dr. Henry Mitchell (Chair. Pub. Com. Vital Statistics Sec.),	Asbury Pk., N. J.

Membership Committee

Dr. Frank W. Wright, Chairman,	New Haven, Conn.
Burt R. Rickards (Chair. Mem. Com. Lab. Sec.),	Columbus, Ohio.
Dr. E. C. Levy (Chair. Mem. Com. Mun. Health Officers Sec.),	Richmond, Va.
Dr. Henry D. Holton (Chair. Mem. Com. Vital Statistics Sec.),	Brattleboro, Vt.
Dr. C. A. Harper,	Madison, Wis.
Dr. W. A. Evans,	Chicago, Ill.

SPECIAL COMMITTEES

Committee to Represent the Association in Conference with National Societies and Associations Organized for the Consideration of Subjects Directly or Indirectly Relating to Public Health Work, and to Report Information and Plans for Co-operative Work

Dr. Henry D. Holton,	Brattleboro, Vt.
Dr. Gardner T. Swarts,	Providence, R. I.
Dr. H. D. Pease,	New York City.
Dr. Wilmer R. Batt,	Harrisburg, Pa.
Dr. Wm. C. Woodward,	Washington, D. C.

Committee to Consider Practical Methods of Education of the People Concerning the Communicability of Gonorrhœa and Syphilis

(Five to be appointed by the incoming President.)

Committee to Solicit and Encourage a Larger Membership in the Association from among Sanitary Engineers of the Countries Represented, and to Consider the Relation of the Engineer Members to the Association

Col. J. L. Ludlow, Winston-Salem, N. C., Chairman.
(with authority to appoint four associates on the committee.)

Committee on Publicity to Convey to the Public Press at Short Intervals Suitably Prepared Abstracts from the Publications

Dr. Wm. C. Woodward, Chair.,	Washington, D. C.
Prof. Franklin C. Robinson,	Brunswick, Me.
Dr. E. C. Levy,	Richmond, Va.

(two more members yet to be appointed.)

Committee to Secure the Incorporation of the Association

Dr. C. O. Probst,	Columbus, Ohio.
Dr. Wm. C. Woodward,	Washington, D. C.

LABORATORY SECTION

Officers

Chairman, Dr. Wm. R. Stokes,	Baltimore, Md.
Vice Chair., Dr. John A. Amyot,	Toronto, Ontario.
Secretary, B. R. Rickards,	Columbus, Ohio.
Recorder, Dr. H. D. Pease,	New York City.

Section Council

Officers and	
Dr. J. J. Kinyoun,	Washington, D. C.
Dr. John F. Anderson,	Washington, D. C.
Dr. B. H. Stone,	Burlington, Vt.
Dr. A. W. Freeman,	Richmond, Va.
Dr. D. L. Harris,	St. Louis, Mo.
Dr. D. G. Revell,	Edmonton, Alberta.

STANDING COMMITTEES

Committee on Membership

Mr. B. R. Rickards, Chairman, Columbus, Ohio.
(With the other members of the Section Council.)

Committee on Program

Dr. John A. Amyot, Chairman, Toronto, Ont.
(With the other members of the Section Council.)

Committee on Publication

Dr. H. D. Pease, New York City.
(With the other members of the Section Council.)

TECHNICAL COMMITTEES

Committee on Technical Progress

Dr. Wm. R. Stokes, Chairman, Baltimore, Md.
(And the Chairmen of the Technical Committees given below.)

Committee on Standard Methods for the Chemical Analysis of Water and Sewage

Mr. E. B. Phelps, Chairman, Boston, Mass.

Committee on Standard Methods for the Bacterial Analysis of Water and Sewage

Mr. D. D. Jackson, Chairman, Brooklyn, N. Y.

Committee on Standard Methods for the Chemical Analysis of Milk

Mr. J. O. Jordan, Chairman, Boston, Mass.

Committee on Standard Methods for the Bacterial Diagnosis of Diphtheria

Mr. B. R. Rickards, Chairman, Columbus, Ohio.

Committee on Standard Methods for the Bacterial Diagnosis of Typhoid

———— Chairman, *

* Dr. Wesbrook resigned. Chairman to be elected by the members of the Committee.

Committee on Standard Methods for the Bacterial Diagnosis of Tuberculosis

Dr. M. P. Ravenel, Chairman, Madison, Wis.

Committee on Standard Methods for the Diagnosis of Rabies

Dr. V. A. Moore, Chairman, Ithaca, N. Y.

Committee on Standard Methods for the Bacterial Diagnosis of Glanders

Dr. W. L. Beebe, Chairman, St. Anthony's Park, Minn.

Committee on Standard Methods for the Preparation of Diphtheria Antitoxin

Dr. H. D. Pease, Chairman, New York City.

Committee on Standard Methods for the Preparation of Smallpox Vaccine

Dr. J. H. Huddleston, Chairman, New York City.

Committee on Standard Methods for the Preparation of Tuberculin and Mallein

Dr. Marion Dorset, Chairman, Washington, D. C.

Committee on Standard Methods for the Bacterial Diagnosis of Syphilis

Mr. Geo. C. Whipple, Chairman, Buffalo, N. Y.

Committee on Mailing Infectious Material

Dr. M. L. Price, Chairman, Baltimore, Md.

Committee on Standard Methods for the Bacterial Examination of Shellfish

Mr. Geo. C. Whipple, Chairman, New York City.

Committee on Standard Methods for Testing Disinfectants

Dr. J. J. Kinyoun, Chairman, Washington, D. C.

The following Committees have presented Final Reports, but were continued for the purpose of caring for the proofs of the report and to consider any new questions that might arise or be referred to them:

Committee on Standard Methods for the Bacterial Examination of Milk

Dr. F. H. Slack, Chairman, Boston.

Committee on Standard Methods for the Examination of Air

Mr. C.-E. A. Winslow, Chairman, Boston.

VITAL STATISTICS SECTION

Officers

Chairman, Dr. W. H. Guilfoy, New York City.
Vice Chair., Dr. W. C. Woodward Washington, D. C.
Secretary, Dr. Wilmer R. Batt, Harrisburg, Pa.

Section Council

Officers and
Dr. C. A. Hodgetts
Dr. Jesus Chico
Dr. Peter Bryce
Dr. J. N. Hurty
Dr. F. L. Watkins
Honorary and Advisory Member, Dr. Cressy L. Wilbur, Wash., D.C.

Committee on Membership

Dr. Henry D. Holton, Chairman, Brattleboro, Vt.
Dr. S. J. Bryne
Dr. Adolf Olivia
Dr. A. J. Douglass
Dr. C. Finley

Committee on Program

Dr. E. C. Levy, Chairman, Richmond, Va.
Dr. Marshall T. Price
Dr. Franklin C. Gram
Dr. Peter H. Bryce
Dr. John Guiteras

Committee on Publication

Dr. Henry Mitchell, Chairman, Asbury Pk., N. J.
Dr. John M. Eager
Dr. A. W. Freeman
Dr. Joseph H. Townsend
Dr. Richard H. Lewis

Committee on Legislation

Dr. Charles V. Chapin, Chairman, Providence, R. I.
Dr. C. A. Harper
Dr. A. G. Young
Dr. William C. Woodward
Dr. F. L. Watkins

Committee on Causes on Death and Revision of the International Classification

Dr. Wilmer, R. Batt, Chairman, Harrisburg, Pa.
Dr. F. W. Reilly
Dr. E. P. Lachapelle
Dr. William H. Guilfoy
Col. J. R. Kean

Committee on Forms and Methods of Statistical Procedure

Dr. M. O. Heckard, Chairman, Chicago, Ill.
Dr. Wilmer R. Batt
Dr. S. J. Bryne
Dr. J. N. Hurty
Mr. F. C. Crum

Committee of Forms of Tables for Vital Statistics

Dr. W. C. Woodward, Chairman, Washington, D. C.
Dr. Marshall T. Price
Dr. F. L. Watkins
Dr. J. H. Townsend
Dr. Charles A. Hodgetts

Committee on Occupations

Mr. Frederick L. Hoffman, Chairman, Newark, N. J.
Hon. A. Blue
Dr. J. H. Hill
Dr. Gardner T. Swarts
Dr. J. F. Edwards

SECTION OF MUNICIPAL HEALTH OFFICERS

Officers

Chairman, Dr. S. H. Durgin, Boston, Mass.
Vice Chair., Dr. Eugene Buehler, Indianapolis, Ind.
Secretary, Dr. E. C. Levy, Richmond, Va.
Recorder, Dr. C. V. Chapin, Providence, R. I.

Section Council

Officers and Washington, D. C.
Dr. W. C. Woodward, Rochester, N. Y.
Dr. G. W. Goler, Detroit, Mich.
Dr. Guy L. Kiefer, Toronto, Ont.
Dr. Chas. Sheard, Tampico, Mexico.
Dr. A. Matienzo,

Committee on Professional Development

Dr. S. H. Durgin, Chairman, Boston, Mass.

Committee on Membership

Dr. E. C. Levy, Chairman, Richmond, Va.
(With the other members of the Section Council.)

Committee on Program

Dr. Eugene Buehler, Chairman, Indianapolis, Ind.
(With the other members of the Section Council.)

Committee on Publication

Dr. C. V. Chapin, Chairman, Providence, R. I.
(With the other members of the Section Council.)

TECHNICAL COMMITTEES

I. Committee on Organization and Functions of Municipal Health Departments

Dr. E. C. Levy, Chairman, Richmond, Va.
Dr. J. F. Edwards, Pittsburgh, Pa.
Dr. A. S. Fell, Trenton, N. J.
Dr. C. H. Jones, Baltimore, Md.
Dr. J. S. Neff, Philadelphia, Pa.

II. Committee on Municipal Vital Statistics

Dr. C. V. Chapin, Chairman,	Providence, R. I.
Dr. H. W. Bond,	St. Louis, Mo.
Dr. J. P. Kennedy,	Atlanta, Ga.

III. Committee on Study and Prevention of Communicable Diseases

Dr. W. A. Evans, Chairman,	Chicago, Ill.
Dr. Eugene Buehler,	Indianapolis, Ind.
Dr. F. G. Curtis,	Newton, Mass.
Dr. G. Custodio,	Havana, Cuba.
Mr. B. R. Rickards,	Columbus, Ohio.

IV. Committee on Uniform Municipal Health Laws

Dr. C. S. Caverly, Chairman,	Rutland, Vt.
Dr. M. Iglesias,	Vera Cruz, Mex.
Dr. R. J. Manion,	Fort Williams, Ont.

V. Committee on Foods, including Water and Milk

Prof. J. O. Jordan, Chairman,	Boston, Mass.
Dr. T. H. Baker,	Louisville, Ky.
Dr. G. W. Goler,	Rochester, N. Y.

VI. Committee on City Wastes, including Nuisances

Dr. P. M. Hall, Chairman,	Minneapolis, Minn.
Dr. G. A. Bading,	Milwaukee, Wis.
Dr. Wm. DeLano,	Grand Rapids, Mich.

VII. Committee on Medical Inspection of Schools and School Children

Dr. S. H. Durgin, Chairman,	Boston, Mass.
Dr. Guy L. Kiefer,	Detroit, Mich.
Dr. L. LaBerge,	Montreal, Que.

VIII. Committee on Industrial Hygiene and Sanitation of the Home

Dr. A. J. Douglas, Chairman,	Winnepeg, Man.
Dr. F. Torralbas,	Havana, Cuba.
Dr. F. W. Wright,	New Haven, Conn.

THE MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

OCTOBER QUARTERLY MEETING

Boston, Mass.

The quarterly meeting of the Association was held at the Brunswick Hotel, Boylston street, Boston, Vice-President Samuel H. Durgin presiding.

In the absence of the Secretary, Dr. Chase of Brookline was elected Secretary pro tem.

On recommendation of the executive committee the following were elected to membership:

T. J. Murphy, M. D., of Boston.

Michael J. Cronin, M. D., of Boston.

John D. Tupper, M. D., of the Westport Board of Health.

Cleaveland A. Chandler, of the East Bridgewater Board of Health.

W. N. Magoun, of the Wellesley Board of Health.

W. C. Munro, of the Woonsocket Board of Health.

J. L. Hildreth, M. D., of Cambridge.

F. E. Constance, M. D., of Brockton.

Miss Elizabeth P. Upjohn, Superintendent of Nurses, Boston Consumptive's Hospital.

C. J. Burgess, M. D., of the Lawrence Board of Health.

Mark W. Richardson, M. D., Secretary of the State Board of Health.

Henry J. Perry, M. D., School Physician, Assistant Bacteriologist, Harvard Medical School.

William H. Davis, M. D., Vital Statistician, Boston Board of Health.

Frank R. Hixon, Bacteriologist, Brigham Milk Company, Cambridge.

THE CARE OF PHTHISIS IN CHILDREN THROUGH THE OUT-DOOR SCHOOL.

By Dr. CLEAVLAND FLOYD

Out-Patient Dept. Boston Consumptives' Hospital

In the work of controlling tuberculosis as an endemic disease especially in the large urban communities, three cardinal factors may be recognized; first, education; second, isolation of every advanced case of phthisis, and thirdly improvement of housing conditions. While all these conditions are applicable to the child, the later two are of vital import if the coming generation is to be more nearly non-tuberculous. The effect of direct contact between the consumptive and the child in the home has recently been clearly demonstrated. In a study of children exposed to direct infection in the home in Boston, among 679 instances where this had occurred 36 per cent. showed definite signs of pulmonary consolidation. Sachs in studying 146 tubercular families in Chicago found 29 per cent of the children showed evidence of tuberculosis. Miller, in New York, found 51 per cent of 150 children of tuberculosis parents to be positively tuberculous. Autopsy statistics are also available and show that 34 per cent of all children over two years of age in a series of 1,131 in this country were tubercular and French statistics show among 1,432 autopsies 37 per cent of tuberculosis.

In children of school age, the incidence of tuberculosis runs equally high and in Paris has been found to be about 40 per cent. Pulmonary tuberculosis was present in 29 per cent of 2,295 school children examined in New York City

recently, and it is estimated that there are 5,000 tubercular children in the Boston Public Schools. From this small amount of data, it becomes evident that phthisis is not infrequent as has been supposed in the early years of life. Certain general facts in regard to the nature of this disease at this age are of importance as indicative of measures to be adopted. Children while more susceptable to tuberculosis than adults frequently present less evidence of its presence and more rarely succumb. The tubercle bacillus may lie dormant for a number of years and with the debilitating effect of shop or factory work, it may become active. The two common types for which it is important to provide are the cases of latent tuberculosis that show themselves generally as debility, lack of development and backwardness and the closed but active case of tuberculosis that has not as yet become an ulcerated process with the discharge of bacilli. Cases of open phthisis are not very common in children and among several hundred cases of pulmonary tuberculosis, bacilli have only been obtained in ten or twelve instances. These are generally hospital cases and should have institutional care. The other two classes of cases of latent and active closed tuberculosis must receive care through the agency of the school. Up to within a few years, the effort of the school has been largely concentrated in the work on the intellect. The close relationship between mental efficiency and soundness of body has only recently been realized. Without doubt the care of the health of the child should be provided for in the home but in a great many instances it does not occur, partly through poverty, and frequently through ignorance. The home should be reached not only through organized health agencies, but through the educational influence of the school. With the weight of the Health Authority felt in the home, and education on physical development radiating from the school, the child cannot but be reached.

But while education on health will generally find a

responsive ear in the child, actual demonstration of how it is obtained is far more valuable. There are several striking results that are obtained when the child is taught what is meant by hygenic living. They are very receptive to new ideas and readily put them into practice making them part of their everyday life. In many instances where phthisical children are given sufficient food, supervision and proper care, the disease is much more easily arrested, than in the adult and relapses are less frequent. This is in part due to the lack of bad habits, and a greater degree of co-operation obtained from the child. Furthermore it speaks well for natural resistance against tuberculosis in children, that not more develop tuberculosis where the degree and duration of exposure is often so marked. With these facts at hand, the value economically in saving to the community these children, on which the city spends some thousands of dollars annually for education cannot be questioned. Even the advanced case of phthisis where it occurs in the early years of life, will frequently, under the care received in a hospital, steadily improve, and occasionally with a degree of rapidity that is remarkable. Often cases with cavity formation will steadily respond to treatment until the disappearance of all symptoms occurs. The cases of latent tuberculosis as they have appeared at the Clinic of the Boston Consumptives' Hospital have been treated through the Convalescent Home of the Children's Hospital with excellent results and where intelligent co-operation can be had in the home and the handicap of poverty is not too great, a high degree of health has been obtained in some of the most congested parts of the city. The Day School should deal with these questions which may be made a great measure of prophylaxis. The suggestions that have been made for open air rooms or out of door classes will materially aid in preventing the development of active disease. I believe there to be some thousands of just such cases in our schools on which tubercular tests would prove positive. To effectually reach

and treat the children with active pulmonary lesions, the Out-Door School has proved itself to be very efficient. Beginning under the Boston Association for the Relief and Control of tuberculosis as a Children's Camp this has developed into a hospital school where health is foremost and teaching is a theraputic measure. The method is effective as it is simple.

The out-door or hospital school as carried on to-day is in the Refectory Building at Franklin Park, and is a part of the Boston Consumptive's Hospital. The roof of the building is used and is especially adapted for this work and will accomodate several hundred children. The present number in attendance is about twenty-five and it is hoped to gradually increase this number to one hundred. All the pupils show on physical examination definite signs of pulmonary consolidation and a record of their condition is kept at the Clinic of the Boston Consumptive's Hospital. A daily routine is in force under the direction of a nurse or teacher. Three simple meals are served with an average caloric value per child of 2589-95. The mornings and afternoons are spent in study out of doors. Cleanliness is encouraged by bathing facilities and exercise or rest given as needed. Where the child is sick, quiet in the open air with a maximum amount of food is all that is required. In stormy weather a canvas shelter is used as a protection and in cold weather heavy clothing and bags for the legs, supply the necessary warmth. The results of this method of treatment have been very satisfactory. The work which up to the present time has been largely experimental has proved the servicability of the out-door school in controlling phthisis in children. Among fifty-two cases treated up to July of this year, twenty-five have had the disease arrested and all without exception have shown marked general and local improvement. In most instances all symptons have disappeared, all of the arrested cases have returned to the public school and continued oversight has so far revealed only two relapses.

Not only has the condition of the lungs received attention but the condition of teeth, eyes and throat have been improved. If then the children in our Boston schools with tuberculosis are cared for in this way, the advanced case placed in a hospital, the latent case treated by co-operation between school and home, and the incipient and well marked cases treated through the Hospital school, the coming generations should show a much higher standard of physical health than the present. With all the effort that is being put forth for civic betterment, no work, it seems to me, is more worth while than that which makes for health and therefore for the happiness of the city's future citizens.

DISCUSSION

Dr. KENNEDY (New Bedford). It is said that there are 5,000 cases of tuberculosis in children in the Boston schools, and I would like to ask what is done with those cases. Are they kept from attending school, or is any particular treatment given to them?

Dr. FLOYD. I have not come in contact with all the 5,000. That is an estimated number. Where we found definite signs of tuberculosis in the lungs those children have been excluded from the public school by the health authorities in most instances, unless the case after a number of weeks or months proved to be arrested, in which case it is reported back to us and we continue to watch its progress.

Dr. KENNEDY. I would like to ask what is done with them when they are excluded. This is a question that we are all interested in. Boston, of course, is in the forefront, and we, of the smaller cities, look to Boston particularly. Five thousand children to be taken care of, and how?

Dr. FLOYD. I would say that we have made a small beginning in this way only: The advanced cases where they are discharging bacilli, which are in the great minority, have been placed so far as possible in hospitals or isolated in the home under the supervision of our nurses. Cases that are latent, that is, having a little temperature, a slight cough, the glands of the neck and other symptons indicating the presence of tuberculosis, have been sent, as far as possible, to the convalescent home in Wellesley, or out of town to relatives, or kept out of doors in various parts of the city. Then the hospital school is making a beginning on the other cases, where there are marked pulmonary signs

but no discharge of tubercle bacilli. The work is only in the beginning.

Dr. OVERLOCK (Worcester). I would like to ask if, in this question of bettering the condition of these children who appear to be tubercular, the question of tenement house inspection has been taken into consideration.

Dr. FLOYD. As the nurses go into the homes about Boston, bad conditions are reported constantly—(and we have found them constantly)—to the Boston Board of Health. We have received excellent co-operation in urging families, proprietors of tenement houses, to clean up and improve housing conditions. I am afraid, however, that we are not all of us laying enough stress on the importance of living conditions in suppressing tuberculosis. It seems to me that is one of the three factors that I mentioned, which needs very much more care and emphasis than has so far been laid upon it.

DAY CAMP TREATMENT FOR TUBERCULOSIS.

By Dr. DAVID TOWNSEND
Boston Consumptives' Hospital

Until recent years, there has been little or no provision in this country, in the fight against Tuberculosis, for the type of case which for one reason or another is unsuitable for the Sanatorium and yet is not sufficiently advanced to require treatment in an advanced hospital or home.

Germany early recognized the need of some such place as the above and in 1900 opened, near Berlin, the first "Erholungsstatt," "Walderholungsstatt," Convalescent Home or Day Camp. This was established under the auspices of the Red Cross Society. Since 1900 many more such Camps have been started throughout Germany, by various organizations. These Camps were intended purely for those persons who are convalescing from acute diseases, after discharge from a hospital, and who are not in a condition to resume work, for those who are constitutionally frail and delicate and for those who are run down from overwork. Such Camps are especially suitable for tuberculous patients. A large proportion of the cases admitted to the German Camps are tuberculous, 33 1-3 per cent. in Frankfort, 35 1-2 per cent. in Hanover, 56 per cent. in Posen and 70 per cent. of all cases in Berlin.

The first Camp in America was opened here in Boston by the Boston Association for the Relief and Control of Tuberculosis, in the summer of 1905 and like the German Camps was conducted through the summer months. Unlike the German Camps, however, the Camp was for Tuberculous patients alone, and only for those who were unsuitable for

the State Sanatorium at Rutland and yet not ready for a hospital, namely the moderately advanced and the ambulatory advanced case. The aim of the Camp, as has been the aim of all subsequent Camps, was to educate the patient in the care of himself and of his sputum and also to teach him better hygiene and better methods of living so that he would not infect his family or his fellow beings.

Each patient is considered as a human being and not as a tuberculous case presenting only points of medical and scientific interest. Every effort is made to relieve all worry and anxiety, to gain his confidence, and to make him as comfortable as possible. Each patient is given individual attention and a careful study of his habits and idiosyncracy is made. In this way it is possible to know just what each patient needs, when to be encouraged, when to be restrained and when to be corrected. In this way and, in this way alone, can a Day Camp be made a success. It is not an easy task and requires high personality and great tact on the part of those who have charge of the work. The patients come for the day only, returning to their homes in the evening, there to carry out the instructions received through the day and to practice the lessons learned. The patients receive two lunches and a dinner each day, also medical attention. Medicines are used only symptomatically. In all the cases there is a noticeable improvement in eating and sleeping and a diminution in night sweats from the start. In the majority of the cases the decrease in the cough and the improvement in the general condition, pulse and temperature is marked after a few days at the Camp. The medical benefit to be derived from a Day Camp may be summarized as follows: a certain number of cases are enabled to obtain admission to the State Sanitorium at Rutland, who were unable at first examination to obtain admission, after a few weeks at the Camp, a certain proportion are enabled to return to work, although not absolutely well, and a certain number advance and find a resting place

sooner or later in an advanced hospital. In addition, it proves that a tuberculous case is not necessarily hopeless until he dies. Many cases in the past have advanced and died simply for no other reason than the lack of proper facilities for their care and education. By far the most important result is that each Day Camp patient becomes a missionary in the field of Tuberculosis and carries the gospel of pure living and hygiene into his home and the homes of those in his neighborhood, thus, leavening the whole.

The equipment of a Day Camp need not be necessarily an elaborate one. Tents can be used, or a more substantial structure of wood or a Camp may be established in connection with a hospital, such as the one in connection with the House of the Good Samaritan here in Boston. The cost of maintenance need not be excessive and varies with the number of patients treated each day. I quote the figures of the Boston Association's Camps for its three seasons.

	1905	1906	1907
Number of days open	123	196	241
Total number of patients, days	3,914	7,522	15,169
Total number of patients admitted	128	196	252
Average daily attendance	71	46	63½
Maximum number of patients on one day	58	72	83
Per capita daily cost	$0.837	$0.638	$0.51

Experience has taught me that in addition to the facts mentioned above that the Day Camp when properly conducted, is of value, first: on educational lines; second: as it removes for a time the sources of infection from the homes and the community; third: as it enables cases which cannot go to a Sanatorium, although suitable, to obtain proper care, and fourth: as it helps to complete the cure in some cases which have been discharged from a Sanitorium.

As a result of the first Camp, here in Boston, Day Camps have sprung into existence in Massachusetts and other

States with varying results largely accounted for by the different personalities of those in charge. As you are all doubtless aware the Day Camp in connection with the Boston Consumptive's Hospital, next to its Dispensary, is one of its most valuable educational assets.

EDUCATIONAL MEASURES FOR THE PREVENTION OF TUBERCULOSIS.

By ALEXANDER M. WILSON
Secretary, Boston Association for the Relief and Control of Tuberculosis

The organization of Health Education Leagues, Committees on Sex Hygiene, and Dental Hygiene, and Anti-Tuberculosis Associations is in recognition of the importance of direct educational methods in the prevention of disease, and all show the great awakening of the public in the past few years to a keen interest in everything that has to do with promoting health.

The whole modern propaganda for health is predicated on the knowledge we now have of the nature of certain diseases, and would have been impossible a few decades ago. To the medical profession we are indebted for being taken into their confidence in these matters, and to that self-sacrificing group in the community we must continue to look for leadership in the great campaign that is to be waged against preventable diseases.

In the case of tuberculosis the great burden of debt is to Koch for his isolation of the bacillus, which changed the whole attitude toward this most destructive of diseases, and opened the way to a direct attack upon it. Koch's epoch-making discovery was given to the world in 1882, but it was not until ten years later that the first organized educational campaign was undertaken. It was a group of far-sighted physicians in Philadelphia who first appreciated that if full advantage was to be taken of the new knowledge about tuberculosis, that knowledge must be made to permeate the community so that people of all sorts and con-

ditions would know how this disease spreads and would be able to apply the simple measures of prevention. So we find the Pennsylvania Society for the Prevention of Tuberculosis, started in 1892, the first organization of its kind in the world.

Similar organizations were formed abroad in the next few years, but it was a full decade before the movement gained its second recruit in this country. In 1902 the Committee on the Prevention of Tuberculosis of the New York Charity Organization Society was formed, and organizations in other cities and on State lines quickly followed. In 1904 the National Association for the Study and Prevention of Tuberculosis was formed primarily to encourage the general organization of the country against this disease, and to-day there are more than 200 local and State organizations having for their chief function the education of people about consumption.

Never before was such a crusade entered upon, nor such armies enlisted for so beneficent a warfare. Let us examine their equipment, take stock of their arms and ammunition, gauge their generals, and determine, if we can, whether their plan of campaign gives promise of successful issue.

The Boston Association for the Relief and Control of Tuberculosis, organized in 1903, may be taken as typical of the whole group in its aims and methods. In one important respect, however, it differed from most other organizations in the conditions it found at the start. In most places the first thing agitated for was a sanatorium for the treatment of early cases. Massachusetts had for several years been successfully conducting the State Sanatorium at Rutland, so the new society could at once address itself to the more general problem without diverting any of its energies toward this very necessary factor in the campaign.

No account of educational measures for the prevention of tuberculosis in Massachusetts would be complete, how-

ever, that did not place due emphasis on the educational value of the sanatorium itself. Rutland sends back into the community 700 patients in the year after giving them the most complete health education. Probably no single measure that we will later describe has had an effect equal to the influence of these missionaries of clean, wholesome living, going back to their home communities thoroughly instructed in the nature of tuberculosis, and impressed with the necessity for themselves and their families of the most scrupulous regard for the simple laws of health.

If no cures were effected at Rutland the institution would still make an adequate return for its yearly cost to the taxpayers by its services as a "normal school of health." In a recent investigation of the home conditions of all the patients discharged to Boston during the first eight months of the present year with their disease "arrested," striking confirmation of the effectiveness of the lessons taught in the sanatorium was gained. In nearly every instance the family had moved to better quarters or the patient had found a way to adjust the old home to the outdoor life he had learned to lead. Rutland, then, has been a great factor in the educational campaign that has been waged in Massachusetts for more healthful living conditions.

The Boston Association at once addressed itself to the work of popularizing the present-day knowledge of tuberculosis. The first methods adopted were the use of the time-honored tract and lecture. A short leaflet entitled "A War Upon Consumption" was prepared with considerable care. There were no precedents to guide, and the first rather technical and formidable drafts were finally placed in the hands of Rev. Charles F. Dole, who exercised his skill in reducing the story to simple language easy to read and easy to understand.

The first edition of this leaflet, numbering 50,000 copies, was placed in the hands of public school children of the

grammar grades with instructions from the teachers that they be carried home. More than a quarter of a million copies of this leaflet have been distributed, and it is still doing service on every available opportunity. Other leaflets have been printed and distributed from time to time, and so far as people will make use of tracts they have been given the opportunity.

A vigorous lecture campaign was instituted at the beginning. The services, particularly of young physicians, were asked and freely given, and efforts were made to secure audiences of every description. A good collection of lantern slides was prepared, and a lantern was offered whenever the size of the audience seemed to warrant the expense. Lectures were given in the Normal School, in all the High Schools, in settlements, lodges, labor unions, woman's clubs, and churches.

The largest audiences were reached in Roman Catholic churches where the clergy lent their enthusiastic support. Following addresses before the Central Labor Union, resolutions were passed recommending to local unions that the privilege of the floor be granted at their regular meetings to physicians sent by the Association. Practically every labor union in the city was reached in this way, and the interest aroused was shown by the eager questions that invariably followed the short addresses.

The success of a tuberculosis exhibition in Baltimore stirred the Boston Society to try this method, so a booth was engaged at the fair given by the Commercial Travellers in Mechanics Hall in October, 1904, and a beginning there made one of the most popular measures that has been found for spreading information about tuberculosis. Proceeding upon the success of this experiment the General Court was petitioned for an appropriation of $2,000 to the State Board of Health to cover the cost of an "exhibition of the means and methods of treating and preventing tuberculosis." This exhibition, under the immediate direc-

tion of Dr. George B. Magrath, was held in Horticultural Hall, Boston, December 28, 1905, to January 7, 1906, and had far-reaching consequences. Different groups in the community, as the teachers, the clergy, the labor unionist, the physician, and others, were invited on special days when a program of addresses was arranged to make special appeal to each.

There was a steadily increasing attendance from the start, totalling 27,000 for the ten days the exhibition was open. The attendance at the lectures toward the end taxed the capacity of the lecture room, and on several occasions standing room was at a premium.

The Boston Association secured enough of the material used at this exhibition to form the nucleus of its travelling exhibit, which from that day to this has been used effectively here in Boston, and has been sent to cities and towns throughout New England. It has been shown 13 times in Boston and 77 times in other places, going outside the borders of New England to three cities: Pittsburg and Scranton, Pa., and Syracuse, N. Y.

To-day, of the New England States, Rhode Island, Connecticut, Vermont, and Maine have travelling tuberculosis exhibits of their own, managed in Connecticut by the State Commission on Tuberculosis, and elsewhere by the State Boards of Health. Nothing has yet been found to surpass the exhibit as a means ot attracting the interest of the masses of the people in this propaganda. Properly advertised, it has been known to draw three-quarters of the population of a town during an exposure of a week.

Ingenius methods have been developed in the display of material so as to attract interest and hold the attention. The graphophone, the talking arc light, and electrical illusions show that conservatism has not deterred its promoters from adopting striking methods of appeal.

The exhibit has by no means exhausted its possibilities. In New England we have not utilized the county fairs, nor

have we devised a compact exhibit that can be sent at little expense to small towns. In Boston we are about to try the exhibit in vacant stores on busy thoroughfares. Small exhibits that can be set up in public schools or in store windows are also to be tried. Many of the newer devices and methods will be used in the health exhibit which is to be a part of the Boston-1915 Exposition in the Old Art Museum during the month of November.

The agitation in favor of a consumptives' hospital in Boston furnished the basis for effective educational work. For months petitions were circulated and the newspapers were supplied with "copy" while this campaign was in progress. The establishment of the Consumptives' Hospital Department by Mayor Fitzgerald at the beginning of his administration marked the successful issue of these efforts. Almost the first act of the trustees after the creation of that board was to send through the mails a twelve-page pamphlet on tuberculosis to the 110,000 registered voters in the city. That was soon followed by the posting of signs warning against the dangers of spitting.

This department, organized to establish a hospital for advanced consumptives, has taken a liberal view of its problem, and by the direct educational methods already described, and by the establishment of an out-patient department with its corps of visiting nurses, and a camp for the day treatment of patients sleeping at home, has shown that it considers the problem one to be met by the isolation of the very sick, the careful instruction of the moderately advanced cases, and the education of the people at large in preventive measures. Coupling these activities with ample sanatorium facilities for the cure of early cases, and with efficient public health administration by city and state, regulating living and working conditions, we have a program for the combat of tuberculosis that should show good results with the passing years.

Without attempting to ascribe the result as due to any

of the measures herein described, some of which are of too recent adoption to have had any marked effect, it is pleasing to note that the consumption curve for Boston has since 1882 shown a steady downward tendency, the rate per 10,000 being in that year 42.26 while in 1908 it dropped to 17.98, a decrease of 57 per cent in twenty-six years.

The organization of the Associated Committees on the Prevention of Tuberculosis of the Massachusetts Medical Society during the presidency of Dr. Arthur T. Cabot, marked an important step in the development of educational work throughout the State. These committees have been active in rousing the medical profession to take its true position of leadership in this campaign. They have stimulated the formation of many local committees and societies, and have co-operated heartily in popularizing the travelling exhibit.

One immediate result of the State-wide awakening has been the creation of three new sanatoria. The completion of these institutions and their consolidation with Rutland under one board of trustees will undoubtedly release some of the energies of the new board in the direction of the educational work which is by statute made one of its functions.

Much remains to be done while a clearly preventable disease annually carries off one-ninth of all the people who die, and much of our effort must continue to be in the line of popular education.

DISCUSSION

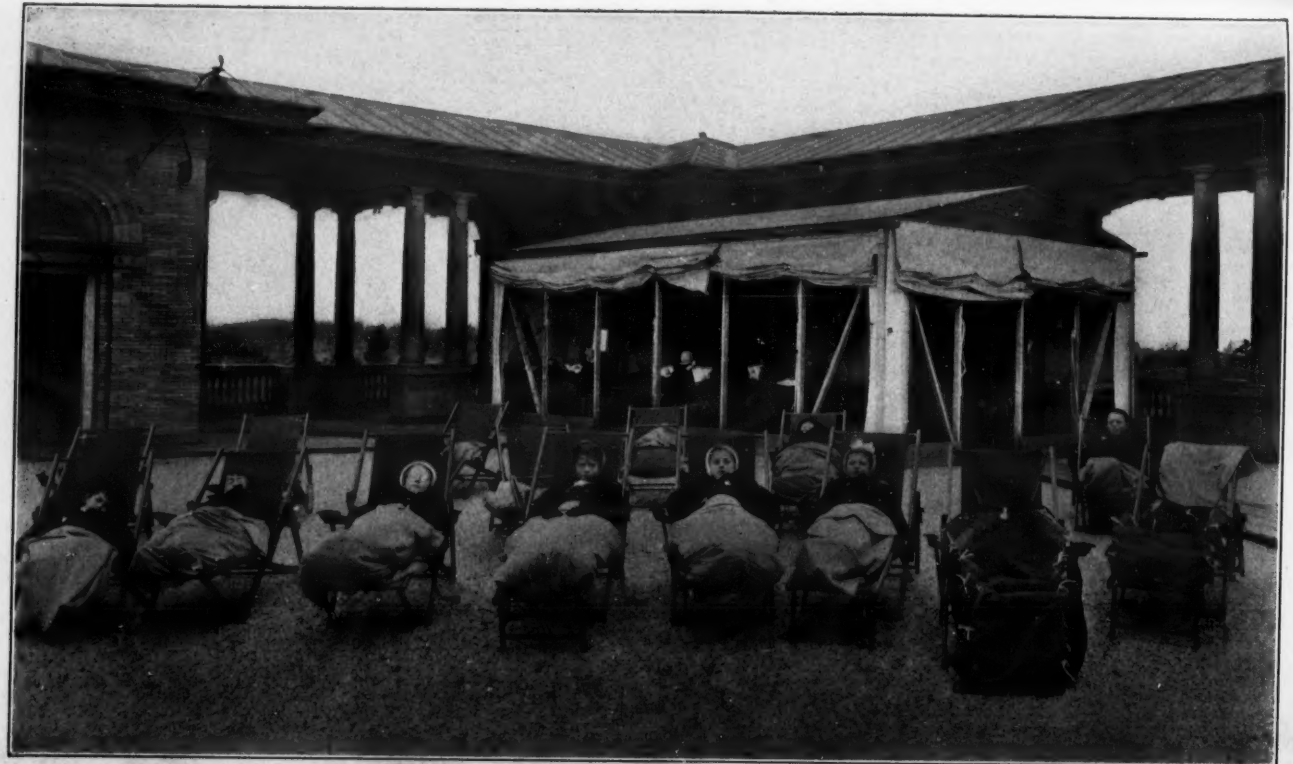
Vice-President DURGIN. We have with us a trustee of the Boston Consumptive's Hospital, Dr. Minot, who was chairman of the committee of the Boston Society for the Relief and Control of Tuberculosis, that managed the out-door school last year. We will ask Dr. Minot to discuss the papers just read.

Dr. MINOT. The question of the out-door school is one that I have been interested in and I believe to be of very great value. The appearance of the children and their whole surroundings changes after it. Dr. Floyd has said that 25 out of 52 children have had the disease arrested; I think I can say better than that. Many of these children have only been there a very short time. Take the children who have been there over a month, and there is a much larger percent who have had their disease arrested. One of the speakers spoke in regard to the homes of these children. Great effort has been made to improve their homes, and the homes themselves I think are all of them in a very different condition from what they were when the children first entered the school. Many of them have been moved to a great deal better houses, many of them to the country. It has taken no small amount of work to bring that about. The outdoor school will not improve merely the health of the tubercular child but eventually the same idea,—abundant fresh air, etc., I believe will be applied to all children at school.

The day camp that Dr. Townsend has described has been of very great use to the community. It has done much towards its education, towards the prevention of the spread of tuberculosis, direct and indirect, and the cases themselves are many of them very much improved. In some of them

the disease has apparently been entirely arrested—I am not personally familiar with the cases—and the changes in the homes there have been very great. The nurses of the hospital have gone to the homes and improved them so far as that is possible. All this work means not merely a doctor and a patient, but it means somebody who is going to the home. That is a large part of the business,—somebody who will keep going there so often and so effectively as to bring about results. One visit is not of any use at all. You have got to keep hammering and hammering to educate the people that they have got to live better some way or other. You cannot hammer a person who hasn't any money, telling him to go home and live out of doors and be comfortable; you have got to find money, you have got to find a house or whatever may be needed in that case, and gradually the people will learn to live a different sort of life. It is a very slow process. Last year the day school was under the charge of the Tuberculosis Association; this year it is under the Consumptive's Hospital Department of the City of Boston, and it is the same problem, carried on in very much the same way, except it is maintained by a different organization, first a private one and now a public one, and it is much larger than it was before. The campaign as mapped out in Boston seems to be regarded by many people, especially people who have come here from abroad, as being a campaign where every class of person is taken care of—on paper. I wish they were all taken care of in fact. And something is happening in each and every class.

Dr. COOLIDGE. As some of you know, I am an institution man, and I am not supposed to know very much about these other parts of the great organization which we have enlisted in this campaign; but I have been thinking a great deal about it and I have been asked a good many questions about it. As busy as I have been with my own work of building the state institution at Lakeville,



OUTDOOR SCHOOL, FRANKLIN PARK—CHILDREN AT WORK

TWO CHILDREN SITTING AT OUTDOOR SCHOOL

OUTDOOR SCHOOL, FRANKLIN PARK.—DINING ROOM

I have been impressed by the importance of a few agencies which I see are gradually becoming organized most effectively.

One of the most important features of the whole campaign is the process of sifting cases and deciding under what conditions each case will stand the best chance of recovery. The more I think about this work and the further I go in the work, the more convinced I am that as large as our campaign is, it amounts to a great aggregation of individual work. The individual case must be studied, the temperament, the home conditions, etc. My own experience has led me to feel that that process of sifting cases, directing them to the proper places, is about the most important part of our work.

I have not heard anything said here today about the night camp, which I think is going to be a very important feature of the work. I believe that there are a great many tuberculous people, tuberculous bread winners, who can continue winning the livelihood for their families if they are given the wholesome night camp in which to spend the nights in the open air.

Then another question that has impressed me as being very important is that of the tuberculosis in the schools about the State, where the subject of open-air schools has not yet been talked and practiced. I was asked only last evening at a small meeting in the town of Bridgewater, "What about these tuberculous children in the schools? What are we going to do with them?" I think there is a problem for our medical school inspectors to take up, and I am of the opinion that some method can be devised for caring for the tuberculous in each school, or in each district in connection with the public schools we have now in operation.

Mr. Chairman, I could talk faster and longer if I were speaking of state institutions, because my experience has been with those institutions. Our three new institutions

which are now approaching completion, I think promise a marked relief of the stress which we have all felt in this campaign, and I believe that for the limited amount of money that has been given us with which to build, we are going to furnish first-class, up to date institutions, and although not having all that we would like in them to do with, they are going to be effective and are going to form a beginning of the greatest sanitarium undertaking in the country.

HOME MANAGEMENT OF CONSUMPTIVES.

By Dr. S. F. COX

Superintendent Boston Consumptives' Hospital

There are many items concerned in the management of a campaign to control tuberculosis in any community, and in the main, it may be stated that such a campaign consists in, *first*, the general education of the public regarding the nature of the disease, how it is contracted, how it is spread from one to another, and the means to be adopted in order to prevent and cure; *second*, the registration of the disease, and *third*, the care and relief of patients and their families.

We are to consider briefly this last item, and more especially are we to deal with the management of the consumptive in his home.

It is usual to classify consumption into three stages.

First, or incipient stage. This is the beginning stage of the disease and offers the most favorable chance for cure. *Second, moderately advanced.* Here the disease is well developed and includes within its scope a wide range of conditions. The chances for improvement are many. Patients frequently go about for varying periods able to attend to moderate duties of work. Some under the best conditions of living and care improve and the process is quiescent, while great numbers advance more or less rapidly. The *third, or far advanced stage*, offers little hope of improvement, and although in many instances life is prolonged, the patients are constantly invalids.

Home management is concerned in all three classes or stages and varies in kind and importance with the stage. In the first stage of the disease, there is no doubt that

a short stay in the sanatorium is eminently the best for the patient. This stay need not be long and the main points to establish are the peculiar features of the disease as manifested in the individual patient and this item will many times control length of stay. The education as provided in sanataria is most important and shapes the course for treatment in the home. In any event whether or not sanatorial experience has obtained, the patient in his home should be under the strict supervision of the physician and the visiting nurse. Home visits by nurses who are especially trained in home work, are of much value; they insure the patient's following out strictly the lesson he has learned at the sanatorium; the nurses are of assistance in sharing the family burden and responsibilities and the nursing associations organized on the plan of co-operation have at hand directly many resources of aid and assistance. Education in this stage as in the other stages is of much importance, and while the principles may have been instilled thoroughly during the stay in the sanatorium, still the application to the daily home routine of life many times needs the assistance of visiting nurse and physician. Often such visits discover some hitherto unknown break in the patient's mode of living inimicable to his cure and dangerous to his family.

Patients in this stage frequently remain at home and improve to full health following in the home the full course as in the Sanatorium. When the patient does not go to the Sanatorium, the physician, augmented by the nurse, institutes in the home the sanatorial routine and by frequent visits insures the faithful following out of the details.

The second or moderately advanced stage offers a most difficult problem for home care for the reason that so large numbers in this stage are able to be about, and because of lack of ambition or the presence of discouragement ignore the rules of health and become sources of contagion constantly dangerous to others. On the other

hand, many in this stage are best treated in the home without danger to the family. Education here is of vital importance — the nurse is the constant watchman. In this stage are frequent acute manifestations of aggravation or complication of the disease and require to a greater or less degree the bed care of the patient. In other words, some nursing is demanded varying in degree according to the extent of the trouble. Much of this can safely be done by members of the family but should in all cases be under the direct control and supervision of the physician and nurse. Patients in this stage may attend day camps, classes, etc., with advantage and benefit, but in any event a visiting nurse is essential in order that home conditions are constantly proper and free from danger of contagion. Food and medicine are important factors in the home care in this stage, for the patient's family as well as for himself. The nurse here as before is the immediate agent in the matters of home relief and assistance.

The third or advanced stage presents the least favorable class for home care. Because of poverty and its attending features it is almost impossible in the great majority of cases to care for the bed-ridden, helpless consumptive, still the visiting nurse again is of invaluable worth in the home. Were it possible to provide hospital beds for all, and if all sufferers in this stage were compelled to go to hospitals, the need of home care in this stage would be removed, but there are many items which arise which I feel should be considered and in a measure respected, and if respected and allowed, make necessary the taking care of those patients in the home. These conditions are family reasons and constantly arise and always have been present as an argument against hospital care. Education here is of greatest importance and not only must we educate regarding the disease but we must teach that hospital care can be a boon to the sick and the dying. It is fair to say that a patient with a promise of health will submit to

absence from family and home while much objection must come when the hospital can assure no hope of recovery.

In conclusion we can say that the home management of the consumptive in the first stage extends and many times inaugurates the sanatorial care of the patient, and spreads education to the surrounding community.

In the second stage it is of importance in education of patient, family, and surrounding community, is a distinct nursing factor of the sick individual and by the supervision and watchfulness of the nurse a safeguard against contagion.

In the third stage home care carefully supervised and in suitable cases replaces hospital care, respecting family requests against removal to the hospital.

DISCUSSION

Dr. FRENCH (Clinton). It strikes me that these very able and instructive papers do not require much discussion, as the weight of evidence is all upon one side, but there is one phase of this question that seems to me,—this being a representative body from all parts of the State, — might well be considered. We know the advantages of the sanitoria that we have in the State and of the proposed institutions that will soon aid us to a greater extent, but they can give us but small aid in comparison to the numbers of those which require it in all parts of the State, and it seems to me that we have got to depend a good deal on the day camps that different towns must institute and carry on. This is being done very largely, and we hope it will be increased in all sections; but there is a side to it that needs to be considered.

Perhaps if I speak of our work in the town of Clinton it might represent many other towns. We instituted a day camp last year and did considerable work, and this year we have converted it into a day and night camp. We have been keeping our patients through the season there and the benefits have been wonderful. I am surprised to see how much cases that have come in, that seemed hopeless, that I have not any idea could have been admitted to the Rutland Sanitorium, have improved. I know of one patient that I sent in in the spring that gained twenty-five pounds in three months there and went home looking wonderfully well. I do not expect she is permanently cured, but the disease is arrested.

We have, as all communities have, a great call on the charitable people of the place to support these institutions. In our hospital, we have to depend on the community largely for aid, and in these day camps, we get little remuneration. If patients are able to pay us three or four dollars a week we let them, but if they cannot pay us any-

thing they are admitted just the same, and if they cannot pay their car-fare to the camp, we pay the car-fare. It is a great drain. For a year or two we can carry it on, for our citizens have responded nobly; but it seems to me that our State legislature should aid us in these matters, and the question is whether we could not ask them to consider this thing and give us aid, and not have to depend wholly upon the charitable people of the town.

Vice-President DURGIN. This is an opportunity for those who are not thoroughly familar with the best methods of doing the work under discussion to ask questions of those who are familar with it, and who are qualified to advise us.

Dr. RIPLEY (Brockton). I would like to ask the last speaker if the city does anything toward the support of the day camp.

Mr. FRENCH. Nothing.

Dr. RIPLEY. I would like to ask that question of other members of the Association, if the various city boards of health do anything towards the support of the day camp.

Dr. CHASE (Brookline). Mr. Chairman, in the town of Brookline, the health department assisted the day camp, both this year and last year, to the extent of about $500. It is carried on by a joint committee from the Brookline Anti-Tuberculosis Society and the Brookline Friendly Society. The camp is put under the general direction of the agent of the Board of Health who represents that department. It is obliged by law to do that, inasmuch as it is contributing financially to its support. The three organizations work together, and the greater part of the money is contributed, by the health department, though the

Anti-Tuberculosis Society furnishes considerable money from subscriptions that it secures. The camp is on the grounds of the Board of Health hospital in the southern end of the town.

Dr. MILLET (Brockton). Why isn't it the duty of Boards of Health to establish night and day camps under the law? How can they escape it if there are people in cities or towns who cannot furnish for themselves reasonable care?

Dr. MINOT. As I understand the law, if a Board of Health rules the patient has tuberculosis, then it comes under the Contagious Act and the Board of Health must pay for its care. But I do not know that there is any law that obliged them to take care of a case until they have so ruled. I believe some cities and towns have so ruled.

Vice-President DURGIN. The city of Boston has elected to have a board of trustees of the Consumptives' Hospital and gives to said board of trustees an appropriation. The Board of Health has no appropriation for such purpose. Another board has the appropriation, and they are wisely and freely using it. Dr .Cox can tell you all about the day camp management.

Dr. COX. The day camp was one of our early departments at the hospital grounds at Mattapan. It was a continuation of the day camp which was started by the Association for the Relief and Control of Tuberculosis of Boston, and in fact that association managed the day camp on the premises the year previous. This department built a rough shack building, which contained examining rooms, a large dining-room and kitchen, and a broad piazza on the slope of the hill. We opened the day camp a year ago last July and continued it all through the winter. The

department does not pay the car-fares of the patients; some of them can pay their own. The organized charities of the city supply car-fares to individuals. We supply the food at the camp, and we also supply milk in the homes, sending milk into the homes not only of day camp patients who need it, but also of other patients, who do not attend day camp but who are taken care of in their homes. The attendance at the camp has gradually increased from a mere handful of 50 patients up to a daily average of over 125. The attendance has been pretty regular, even during the winter months, showing that even the trips to Mattapan, which is to many several miles, can easily be taken by them with a good deal of benefit.

Next to the day camp comes what we call a cottage. It is an open-air sleeping shack, where patients not only stay at night but where they stay all through the day. That cottage was built for that class of people, that otherwise would go to day camp but whose homes were not proper for them to stay at night. That first cottage that was built was more or less of an experiment, the question being whether these people could stand that kind of treatment. I might say that we do not take care of the first or incipient stage of the disease. In other words, any patient who can be admitted to Rutland State Sanitarium we do not take care of; we want to see him at Rutland. We take care of the advanced cases. We opened that cottage the first of April, and we have not seen one winter in it as yet, so we cannot say whether patients in that stage can stand the out-of-door treatment at night as they do in the day camp all day long. We can answer that question better after we have gone through this winter.

The day camp so far has been a success in more ways than one. A lot of the patients have improved; many of them have not improved, but even those who do not

improve are away from their homes for a great part of the day; they are only at home at night. That I think is some benefit.

Dr. FULLER (Walpole). I should like to ask the gentleman if patients are taken from outside of Boston to this camp, provided payment is made.

Dr. COX. No, we don't take patients from outside of Boston. The most recent ordinance of the city allows us to take patients who are bona fide residents of Boston. We don't take patients on the basis of settlement, though the ordinance states that we give preference to citizens of Boston. The first ordinance had a two-year residence clause. That has since been modified so that we can take patients who are bona fide residents of Boston.

Dr. MILLET. As to the ability of an advanced case to sleep out of doors, I can say that for ten years at East Bridgewater our advanced cases have slept out of doors.

A few years ago we were very much interested in getting tuberculosis a registerable disease, and after a whole winter's work we were able to get that disease put among the registerable diseases. We thought that if we placed it alongside smallpox the Board of Health would immediately jump at the chance to do the same that they would with a case of smallpox. There are only a few boards of health in the State, as I understand it, that have lived up to their duty under that law. The city of Cambridge is one, and I would like to ask Dr. Stevens to give the reasons why they did it.

Dr. STEVENS. (Cambridge). Mr. Chairman, I can state that in Cambridge they have organized a day camp, and a permanent one, for the treatment of consumption.

I think the Board of Health of the city of Cambridge were induced to do this because they interpreted the law in a way which they felt forced them to do it. After some considerable delay the city government made an appropriation the build shacks and permanent buildings for the advanced cases. They are located in a very desirable location, near the edge of the town, where they have a very large open area. They have been running these camps, I think, about a year. They went through last winter with them. The camp has been more than full, and they are boarding some of their patients in other places. At the Holy Ghost Hospital the Cambridge Board of Health maintain quite a number, and in some other sections they have taken care of advanced cases. I think that the fact that they felt they were obliged to do it is what stimulated them to bring this desirable thing about.

The camp seems admirably adapted for its purpose. They have one large shack screened on the south side and with shutters on the north side, which can be lowered. In stormy weather they have screens of cloth which are let down and which keep out the dampness and the wind to a certain extent, and still allow a free circulation of air.

They are just now planning for the erection of a large contagious hospital on the same ground. They are going to put in a hospital for smallpox, scarlet fever and diphtheria. Up to the present time they have had no hospital for the treatment of scarlet fever, they have had no hospital for the treatment of diphtheria; but they are now working to get an appropriation of $100,000 from the city to erect a general contagious hospital, which is to be on the same grounds as the tuberculosis camp. It is at present under the management of the Board of Health, but there is a very decided feeling in Cambridge that this hospital should be under the care of a board of trustees. It certainly seems to me very desirable that it should be under a board of trustees rather than under the Board of

Health, and I think that is what is going to be brought about in Cambridge.

Dr. WINCHESTER (Lawrence). Mr. Chairman, the city of Lawrence has had an Anti-Tuberculosis League, which contracts bills, and the Board of Health reimburses them.

Dr. KENNEDY. In New Bedford we believe that we are not obliged to have a tuberculosis hospital. There is a private hospital there to which we send patients. Now, if it is necessary to have a tuberculosis hospital, I think it necessary to send every case there, even in its incipiency.

There is a question that I would like to ask here along the lines of education. We have in New Bedford a woman who has tuberculosis, and who is absolutely regardless of the health of others. She is in a family of six or eight. She scoffs at all hygienic precautions. We have sent our agent to her, and sent him yesterday to read the riot act and threaten her with isolation from her family. Are we going too far?

Vice-President DURGIN. There never has been any doubt with us as to the authority of the Board of Health under the Massachusetts law to move a case of consumption the same as we would move a case of smallpox. The authority is in fact greater in favor of consumption than of smallpox, for there is a little string with regard to smallpox and none with regard to any other infectious disease.

I would say, now that this question has gone so far that the boards of health are just a trifle under challenge, that I know of one board that moved eight years ago very strenuously to create hospital accommodations for consumptives. They found a place ready to be seized and

made use of, and went to the city council with an urgent request, backed well by the best talkers in the council, and asked for $40,000 with which we could have prepared over 200 beds and had them all ready to be occupied in five weeks. The Board of Health and the consumptives were beaten by political and real estate eloquence. Other strenuous efforts were made by the same board, aided by the best men and women of the city, but we were beaten again. $150,000 was appropriated by the city council for the care of consumptives, but with due care not to place it at the disposal of any board, committee or any living person, and thus it slumbered for years. I went to the chief executive with a warrant for $200,000 to be added to the $150,000 to start the thing by somebody, — anybody who would be satisfactory to the government, — and was told it was not enough, that we must have $1,000,000 before we started. Thereafter all manner of means were used by the Board of Health to move the government, but without success. Finally a board of trustees was appointed and given charge of the slumbering $150,000. That board of trustees has done good work and worked as fast as its appropriations would permit.

My board has taken consumptives who could not be properly cared for at home, and as soon as it could find a bed or a suitable place, has put one of them in it. We have never had beds enough. Conditions are now in much better shape, thanks to the action of the State of Massachusetts and our very useful board of trustees.

This much for one board. Let us hear from others.

Dr. McGRATH (Salem). The Board of Health of Salem maintain in their contagious hospital a large ward devoted to the care of consumptives. They have there at the present time seventeen patients. They have also furnished for the past two seasons to the Associated Charities of the city, which maintain a day camp at a place called

Fort Lee, about a quarter of a mile beyond the contagious hospital, dinner for the patients at the camp. They have bought the dinner, cooked it, and delivered it to the camp.

Dr. Field, the chairman of the board, this past year instituted a campaign of education through the newspapers. The board paid for the space to publish his letters. That was done for the reason that he desired to obtain a particular portion of the paper, which practically everybody would see and read. He then, through the kindness of the owner and editor of the paper, obtained from them the right to have published there what he termed The Consumptive's Letter Box, and there were published in that several questions and answers. Many of you gentlemen perhaps have received that in booklet form. These he had printed afterwards, containing all the material published in the press. He considers this the ideal way of educating the public in this question. We have several hundred copies in the office; if anybody is desirous of obtaining copies we will be glad to furnish them.

Dr. VIETOR. The community is being so well educated on the subject of tuberculosis that gradually a consistent system of control of tuberculosis is being worked out experimentally.

I think we all recognize that the first essential in every community is to locate the cases of tuberculosis. It follows from that that the first logical step, as has been brought out by the Chairman, is the registration of tuberculosis. The next practical step, after cases are recognized, is to determine what to do with them, and the various phases of that problem have been brought out in the different papers this afternoon. Personally, I have thought of one point that it seems to me I should be inclined to emphasize in the controlling of the cases of tuberculosis after they were discovered. I think the cases

should be classified first as "closed" and "open," and I think that the local control would be perhaps most useful along those lines. All cases of tuberculosis originate with previous cases of tuberculosis who are discharging bacilli. Consequently from the point of care of prevention the cases which require the greatest seeking out and the most sedulous care are those which are discharging bacilli. Second, we know that cases which are "closed" may at any time become "open" or discharging cases. It seems to me that I should perhaps be a little more inclined to emphasize the constant supervision of the cases which are "closed," so that as they become, or if they become, "open" they would come under preventive control.

Dr. WINCHESTER. Mr. Chairman, as a member of the Executive Committee of an Anti-Tuberculosis League, I would like to report that a year ago at our request the city government appropriated $14,000 for the establishment of a hospital for tuberculosis patients. A board of trustees was appointed by the mayor and this year the appropriation has been increased to $28,000. The hospital will be opened for patients the first of the new year. The maintenance of it I suppose will be taken care of by the city government under its board of trustees.

Dr. COX. In answer to a question I would say that we do not supply special cars for the transportation of patients to the day camp, they go with the general public. These patients are supplied with bags or paper napkins, in which to spit, and in my opinion they are not a source of any contagion in travelling in the cars to and from the camp.

Mr. RICKARDS. I would like to ask if any opposition was made by those living in the neighborhood selected for the camp or the out-door school to the establishment of the camp or the school near their houses.

Dr. COX. In regard to the camp I can say that at the time of the purchase of the property at Mattapan for the consumptives' hospital the immediate neighbors did not object. In regard to the school at Franklin Park there were some minor objections, but when it was called to the attention of these objectors that consumptives were going into the part of the Franklin refectory building which was set aside for the library, and using it as a reading room, the objections to the school, as far as children attending it was concerned, soon disappeared.

Dr. STACK. I would like to ask whether any towns have sent cases to Rutland and paid for them through the Board of Health appropriation.

Dr. CHASE. That was done in Brookline, to my knowledge, a few years ago, but the board of the patient was paid from the appropriation for the Poor Dept. It is not done any longer, our Anti-Tuberculosis Society paying the board of such patients at Rutland.

Dr. STACK. Any other towns besides Brookline?

(Representatives of the cities of Lowell, Brockton, Salem and Taunton and the town of Leominster replied that it had been done there. The representative of Leominster added: "The town of Leominster has a patient at Rutland it is paying for at the present time.")

Dr. STACK. The town to which I belong has had advanced cases, which of course the sanitarium will not admit. We find it costs over twice as much, and it has been a means of reducing our little appropriation quite a bit. I would like to know what other towns had done with their advanced cases.

Dr. CHASE. Mr. Chairman, in my town we take care

of the advanced cases in our own Board of Health hospital or in the neighboring hospitals where we get them admitted. I find comparatively little trouble in disposing of the women patients, but there is more trouble in disposing of men patients. The only patients with advanced consumption we have taken at our hospital were men patients. It is a rather small building, and it is not convenient to have both men and women there. We usually send the women patients to the House of the Good Samaritan or other hospitals in Boston.

Mr. WILSON. Someone asked if we had done anything in the way of establishing night camps. You have heard that both the day camp and the out-door school were started by a private association and afterwards taken up by the city. At the present time that private association is spending a good deal of its energy in developing a Night Camp for "arrested" cases that have come home from the sanatorium and would return, if no other provision were offered them, to unhygienic and improper surroundings in Boston.

We have had given to us within the last six months a tract of twenty acres of land in Mattapan, just within the city limits, and there are developing a boarding camp for patients who are cured. Men who are working through the day at their regular occupations spend their nights with us where they receive a minimum amount of supervision, but good food and good care. They pay $4 a week for their board, but of course this does not cover the expense to us. The camp has been running but a short time and must be considered as still in the experimental stage.

Another question was asked of Dr. Floyd, I think, at the beginning, as to what we are doing with all these 5,000 school children who have tuberculosis. Of course his paper showed that we were caring for relatively few of them

in Boston; but we are getting at this great group of cases among children in various ways. We are urging the establishment of school rooms in the different school buildings throughout the city. I think the latest building that is being put up by the Schoolhouse Commission has provision for an open-air room. Then, again, some of the principals and medical inspectors have become interested in this, and in one instance particularly have put a group of twenty or thirty children out of doors, using just the yard about the school building. So we are attempting to meet this problem in several ways.

I have in my office a number of reports of the efforts that have been made in Boston and in Providence in caring for children in out-door schools, and would be very glad to mail such a report to anyone who would like to have it.

PERSONAL HYGIENE.

By PERCY G. STILES, Ph.D.

Instructor in Physiology, Massachusetts Institute of Technology

EMOTIONS AND THE DIGESTIVE PROCESSES. A paper of unusual interest summarizing our knowledge of this subject has recently been published by Dr. W. B. Cannon.* We are indebted to this author for some of the most fruitful studies of the past decade concerning the movements of the alimentary canal and their nervous regulation. No one is better qualified to estimate the extent to which mental states may influence secretion, peristalsis, and ultimately nutrition. He has himself given us the classic observation that the movements of a cat's stomach are arrested when the animal is distressed or enraged. This demonstration ranks with Pawlow's proof that unless the diet contains stimulating substances belonging to a very limited class the glands of a dog's stomach secrete only when the food appeals to the appetite.

To these two familiar facts Dr. Cannon adds others gathered from the recent literature and not yet incorporated in the text-books. Modifications of the old experiments have now shown that the disturbing effect of transient excitement may last much longer than one would suppose. The sight of a cat may pervert the working of a dog's nervous system to such an extent that no gastric secretion will occur at the next feeding though the dog

* "The Influence of Emotional States on the Functions of the Alimentary Canal." American Journal of the Medical Sciences. April, 1909.

may be hungry and the cat apparently forgotten. Such a suspension of movement and secretion may occur when there is little show of excitement and when the existing cause seems to be trifling. The alimentary canal of a rabbit may be kept from its normal working by mere handling of the animal.

How far are the conditions in the human digestive system parallel with these which have been so often studied in the lower animals? There is an increasing body of information furnished by practitioners and showing that on the whole we can assume a close correspondence. Yet allowance must be made for the more variable and complex character of human emotions. A highly instructive case is that reported by the Scandinavian physician, Hornborg. His patient was a four-year-old boy with a gastric fistula which permitted the measurement of the juice secreted by the stomach wall. Food was shown to the child with the expectation that pleasurable anticipations would be roused and that a flow of gastric juice would occur. The result was quite otherwise. Instead of an emotion of pleasure there was evoked a lively vexation that the food was being withheld. Gastric secretion did not begin. Indeed, as is shown by the related observations of Bogen, the effect of such a trial is to depress the activity of the glands for some time afterward and even when the food is eaten. An intelligent adult, understanding that the coveted food would presently be within reach, would probably give the reaction which so signally failed with the impatient child.

Total arrest of gastric digestion and retention of the stomach contents for twelve hours or more were demonstrated in one case cited by Dr. Cannon where the emotional factor was found in the humiliation brought upon a sensitive woman by her husband's intoxication.

It is pointed out that a disturbance of digestion which is primarily due to mental conditions may be perpetuated

and intensified by other causes. If digestion is delayed and the advance of the food along the canal is hindered by the nervous state, harmful fermentation may set in. Toxic products may then continue to make trouble for the individual, both by local irritation and by their widespread effect when absorbed. It is easy to see that repeated shocks to the nervous system or continued worry may soon secure a chemical ally in their assaults upon the victim's health.

VETERINARY HYGIENE.

By W. L. BEEBE, D. V. M.

Bacteriologist for the Minnesota Live Stock Sanitary Board

OCCULT TUBERCULOSIS OF BOVINES. The fact that tubercle bacilli have existed in lymph glands of man without producing macroscopic lesions was first demonstrated by Loomis in 1890. Since that time many other observers have verified his results. In veterinary medicine the question of occult tuberculosis has been raised by researches into the duality of human and bovine tuberculosis and antituberculous immunization of bovine animals, and the methods of entry of the tubercle bacillus into the body, and it deserves to be studied not only in cases of experimental infection but also in animals naturally infected.

Valeé* has recently published an article on occult tuberculosis in which he calls attention to the fact that not infrequently tubercle bacilli are found in the lymph glands after cattle have been vaccinated by the von Behring method.

Ligniéres first established the fact that in animals vaccinated eighteen months previously, the bacilli may be found in the lymph glands that are apparently quite free from tuberculous lesions. These organisms probably represent the remnants of the inoculation carried out as a preventative measure. The fact that these glands contain virulent tubercle bacilli shows that the vaccination of bovines with even at attenuated culture introduces a cer-

*Journal of Comparative Pathology and Therapeutics. Vol. XXII. Part 2, pp. 133-140.

tain element of danger. The ordinary conception of vaccination is that the animal is rendered immune and that there are no live bacilli remaining. As the human type of germs are used there is a possibility of infecting man either from meat or perhaps milk. This can not be disputed.

Joest, Noack, and Liebrech* were able to demonstrate the organisms in the intramuscular glands when the lesions were confined to the thoracic and abdominal organs. This raises a question for the meat inspector to decide. Perhaps the fact that these occult lesions are occasionally due to commencing tuberculosis and that animals so affected give a typical reaction to tuberculin may account for the very small percentage of inaccuracy of tuberculin.

TUBERCLE BACILLI IN THE BLOOD OF TUBERCULOUS CATTLE. Since Rosenberger announced his startling statement that tuberculosis was a bacteriemia instead of a localized disease several workers in human medicine, namely, Ravenel and Smith, Burnham and Lyons, and others have brought forth evidences that does not verify his results. Brem has shown that acid-fast bacilli were contained in the distilled water that he used in his work. He at first mistook these organisms for tubercle bacilli, but later discovered the error and suggested that it might have been a source of error of other workers.

Recently Schroeder and Cotton* have reported the examination of the blood of 42 tubercular cattle and utterly failed to find tubercle bacilli present. The cattle used for the experiment represent practically all stages of the disease from mildly affected recent cases to old and completely generalized cases. They injected 3 c. c. of blood from each tuberculous animal intra-abdominally into a

*Untersuchungen zur Frage des Vorkommens Latenter Tuberkelbazillen in den Lymphdrüsen des Rindes und Schweines. ("Zeitschrift für Infectionskrank des Haustiere." T III, 1907, p. 257.)

*Bul. 116, Bureau of Animal Industry, U. S. Dept. of Agr.

guinea pig, using in all 95 guinea pigs, and also stained smears from the blood.

Dr. John R. Mohler, Chief of the Pathological Division of the Bureau of Animal Industry, U. S. Department of Agriculture, independently of Schroeder and Cotton examined the blood of 8 cattle by microscopical examination and by injecting the blood from each animal in 5 guinea pigs, using in all 40 pigs, but failed to find the tubercle bacilli present. The microscopical examinations and injections were made precisely in the same manner described by Dr. Rosenberger. It would seem as though the results of these experiments show quite conclusively that tubercle bacilli are not contained in the blood of tubercular cattle.

TUBERCULOSIS IN RANGE CATTLE. The impression is very widespread that an active outdoor life will not only prevent, but cure tuberculosis both in the human and the bovine. At the sixth International Congress on Tuberculosis Dr. Geo. S. Baker presented a paper on this subject in which he says, "The amount of tuberculosis in range cattle reaching the abattoirs at this point (San Francisco, Cal.) proves conclusively that outdoor life alone is not sufficient to either prevent or bring about a cure." He quotes figures to show that on one range where the animals were kept under ideal conditions, the disease increased from .9 of 1 percent to 9 percent in five years and that probably none of these animals were even inside of a barn.

At the same Congress Dr. M. E. Knowles of Montana asserts that cattle are very rarely affected with tuberculosis where they are kept under open range conditions. The marked discrepancy in the reports of these two men might be accounted for as follows: In California while the cattle are never put in barns, they are many times turned into alfalfa fields which would necessitate their coming in more or less close contact with one another. If they were affected

with open tuberculosis and were coughing, the germs might easily be expelled on the ground or if the sputum was swallowed, they would be discharged with the feces. When the germs are once on the grass, it is a very easy matter to infect other members of the herd. In Montana conditions are different. Under strict range conditions the animals are not confined at all. They roam over plains that are sparsely covered with vegetation and do not come in close contact with each other. It would seem as though in order to determine the point as to whether tuberculosis spreads under strict range conditions the only way to do would be to observe a herd of cattle part of which was known to be tuberculous and see if the disease spread to non-tubercular animals.

MUNICIPAL SANITATION.

By CHARLES V. CHAPIN, M. D.
Superintendent of Health, Providence, R. I.

INSPECTION OF HOTELS, RESTAURANTS AND LUNCH CARTS.* Dr. Buehler has recently undertaken the inspection of hotels and similar places with the view of improving their sanitary condition. For the purpose of facilitating this work he makes use of a score card, somewhat like those used for scoring dairies, and in this scoring he attaches twice as much importance to methods as to equipment. Scores were published in the daily papers, and, as a result, a very healthy rivalry was created between the different establishments. Out of 108 hotels, restaurants and cafes inspected, orders for improvement were issued to 108; of 20 lunch wagons, 19 were ordered cleaned.

ISOLATION IN HOSPITALS. While the theory of infection by air still dominates American methods of isolating cases of contagious disease, the English are placing less emphasis upon air infection, and more upon contact infection. In the Report on the Health of the City of Manchester, 1908, page 153, Dr. A. Knyvett Gordon, superintendent of the Monsall Hospital, described the method which has for several years been in use in that hospital, for the isolation of individual cases from the rest of the patients. He says: "It is now abundantly clear that structural separation of the cases is not the most important point, infec-

*Report of the Department of Public Health and Charities, Indianapolis, 1908, pp. 6, 90.

tion being carried — as it is — mainly by hands, clothing and utensils (including toys), and not to any extent by the air of the ward. Consequently, it does not, in practice, suffice to place patients in separate small wards, so long as they are attended by the same nurse, who takes no special precautions, and relies on the separation afforded by the walls or partitions. If the patients in different small wards are treated by the same nurses, they might just as well be in one common ward, except for the sake of appearance." Dr. Gordon states that it is the custom to treat in the general wards cases admitted with doubtful diagnosis and often those suffering with a combination of infectious diseases. In the Monsall Hospital in 1908, 1,763 cases of scarlet fever were treated. Over one hundred cases were admitted for scarlet fever, but did not prove to be such, and these, together with mixtures of scarlet fever with diphtheria, measles, chicken pox and whooping cough, were treated in the scarlet fever wards by the method described below, with no untoward results, except in one instance where there was a delay of half a day, owing to a mistake in orders.

The method of isolation is as follows:

The patient's bed in the general ward is surrounded with a screen covered with sheets, which are kept constantly wet with a weak solution of some disinfectant. The main purpose of this screen is to serve as a label, and to remind the nurses that certain precautions must be taken for the patient behind it. At the same time, I think the wet sheets may possibly arrest infected particles that are projected against them in the act of coughing or sneezing. The only other requisite are two glass shelves fixed on the wall behind the bed, and a locker or portable cupboard made of metal, with an enamelled surface, which can be easily disinfected and kept clean.

The precautions to be taken by the nurses in attending

patients behind this screen or "barrier" are printed on a card fixed to the screen, and are as follows: —

Precautions to be Observed in the Nursing of Barriered Cases.

(1) Rubber gloves are to be worn by the nurse for all manipulations connected with the case, including the handling of clothes. The gloves are to stand in a bowl of 1 to 400 Izal solution.

(2) The following utensils are to be marked and kept on the glass shelves or in the locker provided: —

Spatula, Nozzles, Clinical Thermometer; to be kept completely immersed in 1 in 400 Izal solution.

At least two bowls.

All feeding utensils (plates, spoons, forks, etc.).

(3) A plentiful supply of wet swabs, with a bowl containing Izal solution to receive these when used, is to be kept on the locker. Handkerchiefs or muslin squares are not to be employed.

(4) No toys or books that have once been used inside the barrier are to be taken outside it except to be destroyed.

(5) In every case a square of jaconette is to be placed on the pillow-slip, and over this a piece of muslin; the latter is to be renewed whenever soiled.

(6) An overall is to be worn by the nurse when either the patient or the clothes are handled. This is to be kept inside the barrier.

It is said that the "Patients so treated are more easy, and not more difficult, to nurse." In one of the wards a glass screen was used for a "barrier," but was not satisfactory, as the patient was often somewhat frightened, and it took a good deal of time to keep the glass clean.

It is the custom at the Monsall Hospital to irrigate the throat and nose of every scarlet fever patient with tap water, and since the nurses have worn rubber gloves while doing this, post-scarletinal diphtheria has become a negligible quantity.

CONSOLIDATION OF INSPECTION SERVICE. In New York* school inspection, the general inspection of contagious diseases, and public vaccination were carried on by different officials. Now one inspector performs all these functions in his own district, of course, having a smaller district. The change is found to be a great improvement.

Whenever a case of contagious disease is reported to the health department by a physician its receipt is acknowledged and literature is sent to him containing the rules, and a statement of what is being done by the department. This results in keeping the physician in much closer touch with the work of the health department.

CLEANSING OF MILK RECEPTACLES.† A rule was adopted February 19, 1907, requiring that all the receptacles used for milk or cream must be immediately cleaned upon emptying. An active inspection of dealers was carried on to enforce this law, and 112 arrests were made for its violation. In order to educate the public many of the dealers were induced to have printed upon the paper caps of their milk bottles the following: "This bottle must be washed as soon as emptied, by order of the Board of Health."

*Report of the Department of Health of the City of New York, 1907, page 14.

†Report of the Department of Health of the City of New York, 1907, page 146.

SANITARY ENGINEERING NOTES.

By ROBERT SPURR WESTON
Assoc. M. Am. Soc. C. E.

THE SEWAGE DISPOSAL PLANT IN FRANKFORT-ON-THE-MAIN.* A very complete account of the past and present methods of disposing of sewage at Frankfort and of various experiments which have preceeded various types of construction employed in the works.

The sewers of Frankfort were begun in 1867. The first plant consisted of four precipitation tanks, each 82.4 m. long and 5.5 m. wide, into which the sewage ran from an inlet conduit 6 in. long, first receiving a sufficient quantity of lime and sulphate of alumina to affect the precipitation of the suspended matter. A grit chamber preceded the inlet conduit; the latter was so large that it must be cleaned every four weeks. The cost of operating the works during 1901 was $0.134 per capita and the cost of chemicals $0.041 per capita per annum. Between the years '88 and '02 more than 700,000 cu. m. of sludge were removed from the sewage, an average of 77,000 cu. m. yearly. The works became too small and their operation too costly, and especially troublesome was the frequent cleaning of the inlet conduit, because the dirty water must be discharged into the River Main. The new works were built between 1903 and 1905. Experiments had shown that the old basins were unnecessarily long, so they were cut in half and made 40.4 m. long, and the plant was rearranged in basins each 40.4 m. long,

*Dr. J. Tillmans. Wasser und Abwasser, 1, 305-322.

and so that there were seven pairs of basins arranged on the sides of the inlet conduit. The breadth of the inlet conduit was reduced to 8.8 m., which discharged into the grit chamber, the latter 2.85 m. deep. Beyond the grit chamber are three automatic rakes of the Uhlfelder type. These rakes, which have a diameter of 6 in. and a breadth of 2 in., resemble in construction wheels with 5 shovels on the circumference of each wheel. These shovels consist of- rake teeth placed 10 mm. apart. The rake teeth are moved by the revolving wheel against the stream of sewage and raise the coarse suspended matter out of the stream. The brush takes off the accumulated matter onto an endless belt which discharges into the wagon. The sumps beneath the precipitation tanks are arranged so that the sludge may be pumped off by itself with a minimum of sewage. The construction also provides for a very quiet entrance of the sewage, thereby causing little disturbance of the sludge. The clarified sewage discharges into the Main through an outlet conduit. The cost of rebuilding the whole work was about $400,000. The yearly operation cost is as follows:

Operation	$0.185
Interest and Depreciation.....	0.060
Sinking Fund	0.012
Administration	0.024
Total cost per capita per annum...	$0.281

There is an interesting account of experiments and investigations made between 1887 and 1900 by Lepsius Popp Becker and Freund.

Parallel experiments with chemical and purely mechanical treatment give the surprising result that the advantage of using chemicals was very doubtful, also almost as good a removal of the suspended matter could be obtained by mechanical means. This was also true of the dissolved

matter. Experiments also show that basins 82 m. long could be cut in half to advantage. Experiments with mechanically purified sewage on contact filters were made, but it was not believed the additional purification effected would be worth the cost of construction and operation. Tests of the River Main show that the number of bacteria in the river water below the sewage disposal plant was not markedly affected. Extensive experiments were carried out with the rebuilt works and the records of operation are very complete. Generally speaking, the works removed about 89.4 per cent. of the total suspended matter and 86.4 per cent. of the organic matter. When the effluent was diluted with five parts of the Main water it was non-putrescible. The disposal of the sludge received a great deal of attention, the plant removing from 20 to 30 cu. mm. by grit chamber and rakes, also from 200 to 250 cu. m. by the basins. The sludge contains 91.07 per cent. of water, and in the dried substance there is 43 per cent. of mineral matter and 57 per cent. of organic matter, the whole latter including 17.06 per cent. of fat. To disinfect and cover the sludge the authorities have used turf and peat products. Experiments with filter presses were not a success, but on the contrary centrifugal machines have given very satisfactory results. The so-called schleuderapperat (slinging apparatus)* which is in use in Harburg and Hanover was given a thorough trial at Frankfort. An investigation was made into the feasibility of drying the sludge by electro-osmotic methods, and laboratory experiments will be repeated on a larger scale. The sludge dried in centrifugal machines will be subjected to a further drying in the drying apparatus, mixed with refuse, and burned in a garbage crematory. This apparatus will be in operation in less than a year. The sludge containing from 30 to 40 per cent. of dried substance will be taken by farmers for fertilizer. A certain

* "Reichle und Thiesing, Mitteil, d. Konigl. Prufungsanst. f. Wasservers. u. Abwasserbeseit, 1908, H. 10.

part of the sludge will not be dried, but will be piped to certain near-lying fields. Experiments show that the putrid sludge contains 1.76 per cent. nitrogen and 2.04 per cent. of phosphoric acid. This means that 100 lbs. of sludge is worth about 23 cents as fertilizer. Bechhold showed that the scum on the basin contained from 80 per cent. of fat, and experiments were made looking to the recovery of this by means of benzine. This process does not seem to be practical from the evidence on hand at present. One hundred carloads of sludge can be made to produce 20 cu. m. of gas, which is over 3,600 to 4,000 W. E. per cubic meter. This gas is an excellent fuel gas of low illuminating power. A number of references accompany the article.

OPERATION OF THE INTERMITTENT WATER FILTERS AT THE LUDLOW RESERVOIR, SPRINGFIELD, MASS.* A description of the construction and history of three years operation during the summer months. These temporary filters were built without cement or artificial floor of gravel washed from the bank sand and covered with sand of an effective size of about .30 mm. The underdrains were of tile with open joints. The essential feature of the filters was their intermittent operation and thorough aeration before and after filtration. The water to be filtered came from a very muddy reservoir and contained many organisms of which asterionela caused particular trouble because of its cementing action upon the surface sand which necessitated frequent raking between the usual scrapings and cleanings. In 1907 anabaena was very abundant but caused very little trouble until after death when it clogged up the beds rapidly. Coelosphaerium was also abundant at times but the water was satisfactorily purified in spite of these during practically all the time that the filters were in operation. One especial cause of trouble was heavy ruin during cleaning

*C. F. Story. Eng. News, 61, 301-3, Mar. 18, 1909.

of the beds. This would not only redirty the bed but caused surface hardening which could not be broken with a rake. The process of raking consisted in drying out the bed over night and part of the day and then breaking up the surface thoroughly with heavy rakes. A bed so treated gave as good a water as one newly cleaned and the dirt penetrated very little deeper although the subsequent scraping was made a little heavier. This process was not generally employed in the presence of anabaena or more than twice between scrapings but was found especially efficient in the presence of asterionella. The beds were scraped by collecting the dirt in rows with hoes and then removing in wheelbarrows. The average cost of operation of the filters during three years was $3.73 per million gallons of water and the entire cost of construction was $50,724.

THE MINERAL ANALYSIS OF WATER FOR INDUSTRIAL PURPOSES AND ITS INTERPRETATION BY THE ENGINEER.* An interpretation for the benefit of the engineer of industrial water analyses expressed in ionic form in parts per million. Explanations and formulae are given for calculating the cost of water softening and for determining the value of a water for boiler use.

THE WORK OF BOARDS OF HEALTH.† The author points out in a general way the duties of boards of health, in collecting vital statistics, suppressing communicable diseases, and determining and suppressing nuisances. He calls attention to the importance of educating the public, medical authorities and health boards in regard to the causes and transmission of disease, the need of establishing laboratories to assist the health authorities, and finally the de-

*H. Stabler, Eng. News 60, 355-71, Oct. 1, 1908.
†G. A. Soper. Eng. News 60, 606-8, Dec. 3, 1908. Discussion by M. N. Baker.

sirability of taking public health work out of the political field. The discussion suggests the advantages of a national health board.

A NEW REFUSE DESTRUCTOR FOR WEST NEW BRIGHTON, BOROUGH OF RICHMOND, NEW YORK CITY.‡ This destructor is constructed on the type developed in Great Britain for treating mixed household refuse of ashes, garbage, etc. The garbage wagons dump directly into hoppers from which the refuse is shoveled by hand onto the grates. After a certain amount of clinker has collected it is withdrawn while hot and falls through trap doors into a cooling chamber through which the air for combustion passes. After sufficient cooling the clinker is removed in wheelbarrows. The gases from the combustion pass over the successive grates, mix, and are oxidized in a combustion chamber and then pass into a boiler and thence to an air heater outside of which circulates air for combustion. From the heater the gases pass to the chimney. The destructor is working satisfactorily and promises to continue to do so. The steam power generated has not yet been utilized. The cost of construction was $68,495. The operating cost can not be determined until the plant has completed a year's work. Further details of construction are given.

WATER SUPPLY OF PHILADELPHIA WITH SPECIAL REFERENCE TO THE FILTRATION WORKS NOW UNDER CONSTRUCTION.* This article is mainly an exposition of the bad water situation in Philadelphia and criticism of the means employed to remedy it. Experimental meters installed in twenty houses showed that sixteen used an average of 30 gallons per capita per day while the other four used an average

‡J. T. Fetherston, Eng. News, 60, 485-7.
*J. C. Trautwine, Jr. J. Frank. Inst. 166, 363-94 (Nov.).

of 49 gallons. This leads to overworking the plants, use of insufficiently purified water and constant shortage of supply. The city is opposed to meters and so is enlarging its plant at tremendous cost to meet the unnecessary demand. The water is taken from the highly polluted Schuylkill and the much purer Delaware Rivers. The present improvements involve diminishing the proportion of water taken from the former river and purifying all the water by slow sand filters preceded by gravel and coke "scrubbers." The cost of construction approximates $28,250,000 and the works are expected to have a capacity of 340,000,000 gallons per day — rather less than the demand. Other engineering details are given in rather disconnected form.

PURIFICATION OF PEATY WATERS BY FREEZING.† Chemical analysis of ice and water from the Ottawa and Rideau rivers shows a large degree of purification during freezing. The impurities of these rivers are largely organic. The albuminoid ammonia is reduced about four-fifths and the total solids which are about half organic are reduced from 56 and 145.2 P. P. M. to 4.4 and 5.4 P. P. M. A separate experiment in which 875 cc. of a 1000 cc. sample of Ottawa water were frozen out in a basin gave confirmatory results.

H. R. HOSMER.

THE "SUCROFILTER."‡ This filter is supposed to be made of selected asbestos treated by "special processes" which gave it a laminated structure of a peculiar kind such that it will remove practically all impurities, even microorganisms, from almost any liquid and never stop up. It is especially valuable, made up in divers forms in water purification, for filtering wine, spirits, perfumes,

†Shutt, F. T., Chem. News. 97, 270-1, June 5, 1908.
‡C. Wolters, Z. Angew. Chem. 22, 865-67, May 7, 1909.

petroleum and in all cases where it is desirable to regain the sludge. The article reads like an advertisement.

H. R. HOSMER.

MAIN DRAINAGE OF THE METROPOLIS (LONDON).* A description of the sewerage situation in 1856 and of the methods since employed to remedy it. In 1856 London was discharging her sewage into the Thames through a number of large drains made by roofing over some of its small tributaries. These drains had originally been intended for surface water only and had only been gradually converted into sewers as circumstances forced it. Owing to their slight fall they could only empty at low tide and in flood or heavy rainfall they backed up into the basements, etc. To prevent this was the first consideration when Sir Joseph Bazalgette took up the work. He was practically forced by financial considerations to use the existing drains but he had them discharge into a series of intercepting sewers conveying the sewage by pumping to Barking and Crossness on opposite shores some eleven and thirteen miles down stream. The sewage from the higher lying areas was conveyed by high and middle level sewers to Abbey Mills and thence to Barking. A similar system was used on the south side of the river. These sewers provided for a total flow of about 800,000,000 gallons a day, but it proved necessary to still discharge the rainfall floods through the old outfalls. It is now evident that new intercepting sewers must be built for this purpose since the street washings are very offensive. For several years after the completion of this sewerage system all the London sewage was discharged directly into the river. Then it became necessary to treat it before discharge and this is done by precipitation with 1 gr. of $FeSO_4$ and 4 grs. lime per gallon. The sludge, containing 92% water, is pumped into special steamers

*Edit. Eng. 87, 701-3, May 21, 1909.

for conveyance to the Black Deep in the estuary. The supernatant liquid is discharged into the river which is in a reasonable state of cleanliness. The amount of sludge now shipped averages 8200 tons per day and the average daily flow in 1908 was 283,000,000 gallons, increasing during storms to 1,008,000,000 gallons. The annual working costs at Barking and Crossness come to £118,180, of which £4,000 is due to the sludge steamers. The population is 15,136,192. The old system was designed for a population of 3,450,000. Several important new storm-relief sewers, intercepting sewers and outfall sewers, have been constructed (or are being constructed).

H. R. HOSMER.

THE SMOKE NUISANCE.* This note calls attention to a report of the Syracuse Chamber of Commerce which opposes a policy of fines and ordinances and recommends the study by the fuel users of the prevention of smoke formation according to the following rules:

Gases must be distilled from the coal at a uniform rate and must then be brought into an intimate mixture with sufficient hot air in a fire chamber to burn them completely. They should not then be allowed to come into contact with the comparatively cold boiler surfaces until completely burned, that is, they should have sufficient space and time for complete combustion.

H. R. HOSMER.

STERILIZATION OF POTABLE WATER BY THE MERCURY ARC IN A QUARTZ TUBE.† The author claims to have sterilized completely in 1 to 2 minutes very much polluted waters with the ultra-violet rays from a mercury arc in a quartz tube. With the Kromayer lamp (4 amps., 135 volts) the bacteriacidal action was very

*Anon. Eng. 85, 861.
†J. Courmont, and T. Nogier, Compt. Rend. 148, 523, Feb. 1, 1909.

intense at a distance of 0.3 m. from the tube. No details are given.

H. R. HOSMER.

FILTRATION AND PURIFICATION OF WATER FOR PUBLIC SUPPLY.‡ This paper gives a resume of the main features of water supply under the headings: Sources of Supply, Impounding, Filtration, and Distribution. Under filtration are given diagrams and full descriptions of the construction and the manner of working of the Jewell, Bell, Candy, Puech, and Reeves filters. The different methods of purification with ozone, ferrochlore, and iron, of water softening, and prevention of growth in mains and action of water upon the pipes are also discussed. (The article is of too general and descriptive a nature for further review.)

H. R. HOSMER.

A PLEA FOR A WIDER AND BETTER EXTENSION OF THE KNOWLEDGE OF SANITARY SCIENCE.* A popularized presentation of the need of the community for better sanitation, of air and water, and for better training of physicians, army and militia officers, engineers, nurses and finally of students in general along sanitary lines. In the State of New York during 1907 the deaths from alcoholism numbered 1,023 from typhoid fever 1,688 and from consumption 14,406 — yet the general agitation in favor of better air and water are quite lacking in contrast to the strong movement against alcoholism. This is a question which should be attended to by the State government, and that this may be effected the public in general must be educated to its needs.

H. R. HOSMER.

---

‡John Don, Eng. 87, 126-30: 160-3.

*W. P. Mason, Science, 29, 641-647. Founder's Day Address, given at Lafayette College, Oct. 21, 1908.

NOTE ON THE ACTION OF ALUM ON SCHUYLKILL WATER.* The author finds that the Schuylkill water will react with 9 grs. of crystallized ammonium alum per gallon. A series of tests, made on successive days, of the alkalinity of the water untreated, and after treatment with alum and forcing through a filter bed shows an almost constant uniformity in the raw water but a wide variation in the effluent. It is concluded that the filter requires more care. No details of the construction or operation of the filtering system are given.

H. R. HOSMER.

SEDIMENTATION OF WATER SUPPLY AND ITS RELATION TO TYPHOID FEVER IN WASHINGTON, D. C.† A detailed consideration of the condition of the water supply and the corresponding typhoid death rate from 1888 to 1905. During that time the water supply underwent several radical changes involving a variation of time of sedimentation from none to two days, but the typhoid rate does not show the expected fluctuations. Moreover, since the use of the filtration plant installed in 1905 the death rate has fallen but little. A comparison of the typhoid death rates of Washington and Richmond during 23 years shows a remarkable parallelism in spite of the great differences in their water conditions. The author concludes that there is some as yet undiscovered factor in the situation more important than the water supply.

H. R. HOSMER.

PIPE LINE AND PURIFICATION WORKS AND EXPERIMENTS OF THE BALTIMORE COUNTY WATER AND ELECTRIC CO.‡ A detailed description of the engineering side of the work concluded by the report

*Henry Leffman, J. Frank. Inst. 167, 312-314, May, 1909.
†Francis F. Longley, Eng. News, 61, 431-433, April 22, 1909.
‡A. E. Walden, Eng. News, 61, 283-287, Mar. 1909.

of some experiments upon the comparative efficiency of slow sand and mechanical filters, and the effect upon bacteria of ozone, hypochlorite of lime, and $CuSO_4$.

The mechanical filter is cheaper to install and more easily worked with waters that suffer sudden changes of turbidity, but in this case requires careful watching to insure the presence of plenty of alum in time to handle the high turbidity before it reaches the bed. The sand filter is more economical to operate and except with very high turbidities and bacterial counts, more efficient. At times the alkalinity of the water does not seem to be in a form suitable to react with alum when addition of mud or clay is necessary to bring the effectiveness of the mechanical filter up to that of the sand. For good results the mechanical filter must be run continuously after the blanket forms as starting or stopping disturbs it. Experiments with an ozonizer show that this method of purification is not economical with a water of high turbidity or organic matter, at least without previous use of roughing filters. 0.1 g. hypochlorite of lime added every other day and 0.7 g. alum per gallon produce a sterile water, and there are indications that these quantities can be further reduced with equally good results. The hypochlorite reduces also the quantity of water required for washing the beds. $CuSO_4$ fed into the underdrains of the filters keeps bacterial growth under control easily.

H. R. HOSMER.

CHEMICAL LABORATORY NOTES.

By FRANKLIN C. ROBINSON
Prof. of Chemistry, Bowdoin College, Brunswick, Me.

NEW DISINFECTANT. "Keramyl" is the name given to a 25 per cent. solution of commercial hydrofluosilicia acid in water, when used as a disinfectant. One-half per cent of this in water kills common bacteria and yeasts. It does not act very rapidly and such small dilutions require from 4-12 hours to do its work. Stronger solutions act more rapidly. It attacks iron and zinc readily, but has little action on copper or brass or tin.

ELECTROLYTIC DISINFECTANTS. There is a marked revival of the use of hypochlorites as disinfectants, especially in water and sewage, and stable disinfection. There is a tendency also to prepare these by electrolysis, from solutions of chlorides. Magnesium hypochlorite is preferred to calcium for various reasons, and now that magnesium chloride can be obtained cheaply, large quantities of this are changed by electrolysis to the hypochlorite for disinfecting purposes, especially in England. One of the Metropolitan Boroughs of London has a municipal plant for its manufacture, and has made and used for the last three years about 20,000 gallons a year, costing about $200 per year.

The greatest obstacle to the proper use of disinfectants in the United States, as elsewhere, is their excessive cost.

When efficient ones can be obtained for about one cent a gallon, as above, there will be a greater tendency to use them as they should be used in and around our dwellings. Of course, hypochlorites cannot be used in ordinary room disinfection without great care, owing to their bleaching action on colors and corrosive action on metals.

In an article published in the English Journal of Hygiene, 1908, 8, 634-697, some interesting experiments are given, showing that the more virulent type of an organism is less easily killed by a disinfectant than the less virulent; also that disinfectants of the emulsion type, that is, those which contain the tar acids and give milky solutions when diluted with water, are much lessened in their action by the presence of floating organic matter, such as dust, charcoal, feces. In such cases it is safer to use 50 per cent. more of the disinfectant than when such things are absent. Disinfectants which give clear solutions, as carbolic acid and formaldehyde, are much less affected by such organic matter, unless, as in the case of mercuric chloride, the disinfectant combines with the organic matter, as that does with albumen.

FLOUR BLEACHING. In the last number of this *Journal*, some account was given of chemical tests upon bleached flour made by the food commissioners of North Dakota. Since then, an article has been published as a bulletin of the Minnesota Agricultural Experimental Station, giving results of experiments tending to show that such bleaching is not deleterious to the health of those eating the bread. Attention is also called to the presence of small amounts of nitrates in the air, many waters, smoked bacon and ham, and such vegetables as celery and lettuce. This controversy illustrates again the necessity of hearing both sides before forming an opinion, a fact which is also brought to mind by the benzoate of soda discussion.

BENZOIC ACID. Whatever opinion we may have as to the merits of the question of the use of this acid or its salts in food, we are interested, as chemists, in the tests for it. One of the best of these is to distill some of the food, previously shaken up in water acidulated with sulphuric acid, extract the distillate with ether, and then evaporate the ether which contains any benzoic acid present. The ether residue is dissolved in warm water and treated with one drop of weak hydrogen dioxide, and then one drop of ferric chloride solution, and the containing tube immersed in boiling water. The characteristic violet color of salicylic acid into which the benzoic was converted by the hydrogen dioxide appears. The test was devised by A. Joneson, and given in Pharm. Chem. 1904, 48.

BIOLOGICAL LABORATORY NOTES.

By FREDERIC P. GORHAM

Associate Professor of Biology, Brown University
Bacteriologist, Providence Health Department

THE "SCRAPED TUBE REACTION" FOR THE SEPARATION OF THE MEMBERS OF THE TYPHOID GROUP. In the May number of this Journal we noted the "Scraped tube reaction" for the separation of certain members of the typhoid group of organisms and credited it to Chatterjee.* Since that time Dr. N. MacL. Harris has called my attention to the fact that this discovery of Chatterjee really dates back to the observations of Achard and Renault.† It was also used by Widal & Nobécourt,‡ by Cushing,§ and by Buxton.‖

STERILIZATION OF SUGAR MEDIA. The question of the changes which various sugars undergo during the process of sterilization, has by no means been settled. The accuracy of the determination of the fermentative action of various organisms upon the different sugars is, of course, immediately dependent upon this question. This matter is discussed at some length by Elser and Huntoon in their "Studies on Meningitis."** They made use of the

*Cent. a. Bakt. Erste Abt. Orig. XLVIII, 1908. 246.
†La Semaine Medicale, 1898, pp. 136 & 512.
‡La Semaine Medicale, 1897, p. 285.
§Johns Hopkins Hospital Bulletin XI, 1900, 166.
‖Jour. Med. Research III, 1902, 206.
**Jour. of Med. Research, XX, 1909, 403.

fermentation test for the purpose of finding a ready and reliable means of differentiation between the meningococcus and other Gram negative cocci.

These authors first refer to the difficulties which they found in securing pure sugars. They found it necessary to supplement the results obtained by using Kahlbaum and Merck products by additional tests with sugars derived from other sources.

The proper sterilization of the sugar media was found to be difficult, and improper sterilization would lead to discordant results. A ten per cent solution of the sugar in distilled water was sterilized at 100°C for ten minutes and added to the medium prepared and sterilized as usual. Great difficulty in thus sterilizing certain kinds of sugar solutions was found, notably in the case of inulin. Some of these products contain very resistant spores which were not destroyed by the above method nor by the usual fractional sterilization. These spores germinated slowly and their presence was not suspected until the culture had been at incubator temperature for several days. The growth of these and similar spores may account for some of the discordant results of other observers. Similar experiences have been noted by Hiss* and by Norris and Pappenheimer.†

The authors also tested the suitability of various liquid media for the sugar test and then refer to the use of solid media in plates as suggested by von Lingelsheim‡ or as agar slants as lately suggested by Sherman and Ritchie.§ The complete description of their methods of preparing these agar slants with various sugars and their methods of sterilization is given on p. 406 of their paper.

In Science XXI, 1905, 481, L. A. Rogers described a method of using the cavity of a concave slide for fermenta-

*Jour. Exper. Med. VII. 1905, 547.
†Jour. Exper. Med. VII. 1905, 450.
‡Klin. Jahrb. XV. 1906, H. 2.
§Jour. Of Path. and Bact. XII, 1908, 456.

tion tests, thus making use of small amounts of the sugars and making it possible to test a long series of sugars with little trouble. This method is of advantage for the reason that the various sterile sugar solutions may be kept on hand ready for use.

It will be remembered that "Standard Methods" as amended by the Progress Report of the Committee at the Winnipeg meeting recommend that all sugar media be sterilized in the autoclav at 120 C for ten minutes and that the sterilizer be hot when the media are introduced, and that the media be cooled rapidly. Unless these precautions are observed lactose media will give positive tests for gas formation by gas forming bacteria which ferment dextrose but do not ferment lactose. The length of time that a sugar is treated and not the temperature seems to be the important factor in inverting the sugar.

PUBLIC HEALTH LEGISLATION, NEWS AND NOTES.

By F. H. SLACK, M. D.
Director, Boston Board of Health Laboratory

THE COMMON DRINKING CUP. The Kansas State Board of Health in a regulation effective after Sept. 1st, 1909, forbids the use of the common drinking cup upon the railway trains, in the railway stations and the public and private schools of the State.

There is no way through which disease could be more easily transmitted from one person to another than through the use of the common drinking cup, and the position taken by the Kansas State Board of Health on this question is to be commended, and the adoption and enforcement of such a regulation in our other States would be of great benefit to the public health.

It would be better not to limit such a regulation, but rather to let it apply to any place of public or private congregation. The use of such drinking cups in hospitals or dispensaries, for instance, where persons suffering from various diseases gather for advice and treatment is most reprehensible, while the use of the common communion cup in churches is a filthy custom, and one which offers unrivalled facilities for the transmission of disease.

SMALLPOX QUARANTINE REMOVED. Montana follows the lead of Minnesota and there will be no quarantine for smallpox in that State after January 1st, 1910. The State Board of Health Bulletin for Aug. '09, says:

"Get vaccinated and protect yourself. The State should not be expected to protect citizens who can protect themselves at a minimum cost, and by the exercise of common intelligence. Smallpox is a disgrace, a dangerous disease, and a reflection upon any person of intelligence."

It remains a fact, however, that in many cases the health authorities have to use their superior knowledge and protect the public against the inclinations of many people.

There are, and always will be, in every community, a small number of people who crave notoriety, and are willing to obtain it by opposing any scientific truth.

These people talk so loudly in their attempts to convince themselves that they win many followers among those who are willing to let others do their thinking.

That a people left to have their own way in the matter of vaccination will not take proper precautions is well shown in Utah, where smallpox is said to be endemic and on the increase.

There is no better way of handling smallpox than by compulsory vaccination, and States following this method have so few cases of the disease that the question of quarantine is but a minor one.

THE BOSTON BOARD OF HEALTH has recently issued a regulation forbidding the exposure of meats, cut fruits, candy, etc., to dust and flies; another regulation forbids the sale of dirty or polluted ice; and a third provides that milk in stores shall not be kept in bulk or sold from open receptacles, as has been the custom, but shall be sold only in the original unopened bottles or cans. These regulations are all conducive to more cleanly and healthful conditions, and the one relating to milk is especially commendable. It is universally accepted that many of the summer diseases of children are caused by impure milk, and no milk is more impure than that sold in the stores of large cities. Any measure which thus prohibits

the promiscuous handling to which such milk is exposed in the ordinary store or bakery, which removes all temptation to mix to-day's supply with what was left from yesterday, and instead offers a comparatively clean bottled product, must be beneficial.

The cost will be slightly higher, but this should be more than compensated for in increased health.

CONNECTICUT TUBERCULOSIS LEGISLATION OF 1909.* The present Legislature has enacted some very important anti-tuberculosis laws. These include an act prohibiting spitting in public places, and while it does not differ greatly from the ordinances now in force in our larger cities, it provides a law applicable to the entire State.

An act concerning the reporting and care of tuberculosis is another measure of great importance. This act declares tuberculosis to be an infectious and communicable disease dangerous to the public health, and requires physicians to report to the local health officer all cases coming under their care, and to give such instructions as will provide for the safety of all persons occupying the same house or apartments. If the physician reporting is not willing to assume the care of the patient, then this duty devolves upon the local health officer. This law takes effect October first, and prior to that date a copy of the act will be sent to all the physicians of the State.

A third act is that appointing a Board of Directors to establish County Homes for the care and treatment of those suffering from tuberculosis. It proposes to establish three of these homes at once and an appropriation of $175,000 is made for this purpose, with $75,000 additional to maintain them for one year. These appropriations, with $50,000 given to aid the Gaylord Farm Sanatorium at Wallingford, Wildwood at Hartford and Undercliff at

*State Board of Health Bulletin, July, 1909.

Meriden, make a total of $300,000 given by the State of Connecticut to aid in carrying on the anti-tuberculosis work during the next two years.

THE FLORIDA STATE BOARD OF HEALTH LABORATORY* has been temporarily closed, pending the engagement of a bacteriologist. Since the State Board of Health established a clinical laboratory five years ago, it has gradually grown in popularity, the number of examinations increasing from year to year. Especial attention has been given to the examination of specimens for the ova of hookworms in the vigorous war now being waged against that disease.

While the majority of the laboratory tests have been made for Jacksonville, where the laboratory is located, the city of Tampa has run a close second, and in response to a petition from the Tampa Board of Trade, the Hillsboro Medical Society and several other organized bodies, together with a great number of physicians, the State Board of Health has decided to establish a branch laboratory in that city.

STATE HYGIENIC LABORATORY IN NEVADA. At the last session of the Nevada legislature a State Hygienic Laboratory was created at the University of Nevada at Reno and the administration placed in the hands of the Board of Regents of the University. Dr. Winfred B. Mack, Professor of Bacteriology in the university there has been appointed Director. Dr. O. P. Johnstone, M. S., M. D., has accepted the position of Pathologist and Bacteriologist.

Dr. Johnstone is a graduate of Rush Medical College. He was formerly Professor of Pathology in the University of Colorado. He left Colorado in the fall of 1907 to become Pathologist at Mercy Hospital, Pittsburg, which position

*Florida Health Notes, Aug., 1909.

he resigned to accept his present one. He is exceptionally well qualified by both temperament and training for this work and the people of Nevada are to be congratulated on securing the services of so competent a man.

TUBERCULIN TEST UPHELD BY COURT.* A decision of great interest to all public health workers and especially to those engaged in working for a pure milk supply was handed down by Joseph G. Donnelly, Referee and Court Commissioner of the Milwaukee circuit court in an action brought against the city of Milwaukee and Health Officer Gerhard A. Bading.

The issue of fact before the referee was that raised in paragraph ten of the complaint which reads as follows: "That the tuberculin test of plaintiff's milch cows required to be made by Section 24 of such ordinance, herein referred to, as plaintiff is informed and believes is wholly unreliable, untrustworthy and entirely worthless so far as being any guide or protection to the public as to whether or not the cows tested by the tuberculin test, as provided by Section 24 are free from the germs of tuberculosis or any other contagious disease."

While certain of counsel contended the only question at tissue was as to the efficiency of the tuberculin test the referee ruled that the allegation as to the worthlessness of the test as a protection of the public widens the field of inquiry and makes relevant testimony offered as to the nature and cause of tuberculosis, the characteristics of the germs producing it in man and cattle, and the transmissibility of the disease from the bovine to the human.

The plaintiff produced a large number of dairymen and farmers who testified both as to the freedom of their families from tuberculosis while drinking freely of milk, much

*It is expected that a more comprehensive report of these proceedings will shortly be published in this journal.

of which was presumably from tuberculous cows, and as to the inefficiency of the tuberculin test as proven by the evident failure to find lesions in condemned cattle from their own farms.

Of the expert witnesses for the plaintiff Dr. Claude D. Morris made the somewhat startling statement that he believed a few bovine tubercle bacilli in milk to be beneficial. Dr. Wilhelm Becker and Dr. Henry L. K. Shaw acknowledged that trustworthy cases of bovine tuberculosis in the human had been demonstrated. Dr. Morris and Dr. Moore, for the plaintiffs, gave testimony confirming the defendant's claim as to the value of the tuberculin test. Among the experts who testified for the defendant were Dr. Park of New York, Drs. Ravenel and Russell of Wisconsin, Dr. Schroeder of Washington, Dr. John R. Mohler, Chief of the Pathological Division of the United States Bureau of Animal Industry, and Dr. Chute and Dr. Clark, respectively former and present State Veterinarian of Wisconsin.

The testimony of these experts, based on years of careful work, was practically unanimous and proved to the satisfaction of the referee that human and bovine tubercle bacilli, while of the same family, have certain distinguishing characteristics, that bovine tubercle bacilli may and do infect the human (Dr. Park concludes that twenty per cent, and Dr. Ravenel that approximately thirty per cent, of tuberculosis and death from tuberculosis in children is due to bovine tubercle bacilli), and that the tuberculin test is an accurate and trustworthy aid for the detection of tuberculosis in cattle.

The referee says: "After careful consideration, I am fully convinced of the value of the tuberculin test. Applied and interpreted by competent men, its efficiency is clearly established. Instead of being unreliable, untrustworthy and worthless it has been proven a marvellously accurate scientific method of ascertaining tuberculosis in cattle." He

reports the following findings of fact upon the testimony taken and other proceedings had:

1. That bovine tuberculosis is transmissible to man.

2. That there is danger of infection to man from bovine bacilli in milk from tuberculous cows.

3. That the tuberculin test, while not infallable, is a reliable, trustworthy and useful diagnostic agent for determining the existence or non-existence of tuberculosis in cattle.

BOOK REVIEWS.

"Tuberculosis," A Preventable and Curable Disease. By S. ADOLPHUS KNOPF, M. D. *Moffett, Yard & Co., New York. With* 115 *illustrations,* 8 *vo.,* $2.00 *net.*

In this volume Dr. Knopf has brought together and elaborated much of the material contained in his many valuable and popular papers upon tuberculosis, with especial reference to the individual in his combat with the disease, and the innumerable social conditions which favor its prevelance and the means of their avoidance.

In the first four chapters the attention is directed particularly to the tuberculous individual, how he should conduct himself to make a successful fight against the disease, and how he should live in order to avoid communicating the disease to others. Much detail is devoted to this part of the subject and the method of the open-aid treatment at home is fully described with numerous illustrations of the many ways, now so fully known, of obtaining open-air conditions, both by day and night. An extended description of the author's window tent is included, together with illustrative reference to various sleeping balconies and shacks. Although so much space is devoted to the care and proper mode of life of the tuberculous sufferer, the book is "not intended to replace the physician," as the author explicity declares at the outset, but to aid both the sufferer and the physician, the supervision and guidance of the latter, as he states, being essential. Unlike some phthisio-therapeutists of the present day, Dr. Knopf still believes that climate has its value in the treatment.

"To deny the beneficial influence of certain climatic regions," he says, "as a valuable adjuvant in the treatment of tuberculosis is as dangerous and unscientific as the belief in the specific curative quality of any particular climate." The weighty responsibility of the physician in taking charge of a case of tuberculosis, both towards his patient as well as towards the consumptive's family, and the community is fully emphasized, as it should be, and one whole chapter is devoted to this most vital subject. By a careful study of this portion of the book, the general practitioner, provided he has made his diagnosis early, will be well prepared to carry out the plan of the open-air treatment, and will appreciate the constant attention to details necessary to obtain success. If any criticism is to be made upon the scheme of treatment it is, in the opinion of the reviewer, in regard to the lack of sufficient reference to the feeding of the patient and to rest and exercise. When and why the patient should rest and when he can take exercise without injury, and how, does not appear to be set forth with sufficient clearness. Neither is the matter of feeding, of such paramount importance, given the attention which it deserves in these days of more exact methods of diet and food values. The careful and exact regulation of the tuberculous patient's diet with reference to his present condition and to the end to be attained deserves as much attention perhaps as the arrangements for his out-door living.

The next seven chapters are devoted to the duties of sanitarians, health authorities, municipalities, states, educators, philanthropists, employers of labor, and all the various official and private instrumentalities in "the combat with tuberculosis" and give the author's well-known views and recommendations as to the duties of these various bodies.

Proper housing is accorded rightfully very considerable attention and plans of modern tenement houses and private

dwellings illustrate the subject. Two very attractive cuts are given of the proposed Shively sanitary tenements, so constructed as to afford a balcony for every apartment. These are soon to be erected in New York City through the philanthropy of Mrs. William K. Vanderbilt, Sr. All the modern means of combatting and treating tuberculosis are described: The Tuberculosis Class, originated by Dr. Pratt of Boston; the Day Camp, first established in the United States by the Boston Association for the Relief and Control of Tuberculosis; the Open-Air School; the Tuberculosis Dispensary; and the Sanatorium. All the State sanatoria now in existence are described and illustrations of some of them are given. A number of pages are devoted to the cleaning of mail-bags; railroad hygiene; breathing exercises for children; the rearing of the child of tuberculous parents; the prevention of smoke and dust, and church hygiene. The educational propoganda by means of the travelling exhibit; lectures with lantern slide illustrations; press notices; popular circulars; tuberculosis Associations, etc., is described. A plea is made for cremation as a preventive measure, both on account of the possibilities of infection through the earth worm, and also on account of its economic advantages.

The recent successful Christmas sale of Red Cross stamps is referred to, and the interesting fact noted that over $100,000 was obtained in this way for anti-tuberculosis work.

Hardly any of the means for the amelioration of the health and living conditions of the masses as indirect means of preventing tuberculosis fail of mention. Playgrounds, swimming tanks and gymnasiums in schools, ventilation of churches, workshops, offices, etc., restriction of child and women labor, the avoidance of the use of alcohol, the care of mothers before and after birth of their children, etc.

In conclusion Dr. Knopf quotes two phrases from Pas-

teur upon which he hopefully moralizes upon the future outlook regarding the ultimate eradication of tuberculosis. The first is the well-known saying: "It is in the power of man to cause all parasitic diseases to disappear from the world," and the other, "Our duty to do good only ends where our power to do good fails."

Among all the other good illustrations there are two excellent full-page ones of Prof. Koch and Pasteur. One cannot help regretting that so excellent a book designed for the general public should not have been published at a price which would bring it within the means of the great mass of people. Many would purchase a dollar book who would wistfully turn away from a two-dollar one, the price of this one. Why, a book the size of this, an octavo of three hundred odd pages, should weigh two pounds, and in consequence seem about as heavy as lead when one holds it in the hands any length of time is a mystery to one uninitiated in the art of book-making. That so much popular literature upon tuberculosis is now demanded by the people is a very hopeful indication of the general interest manifested in the subject. A few years ago hardly any publisher would have considered the publication a popular book upon this subject a profitable venture.

EDWARD O. OTIS.

The Human Body and Health. (*Intermediate.*) By ALVIN DAVISON. *American Book Company: New York, 1909.*

This school hygiene is in some respects in advance of its numerous competitors. Its treatment of infectious diseases and safeguards against them is unusually clear and sensible. The advice given in regard to diet is in the main well considered. But the trail of the W. C. T. U. is over the book. In season and out of season it dwells upon the ruinous effects of alcohol. The beer-drinker's heart

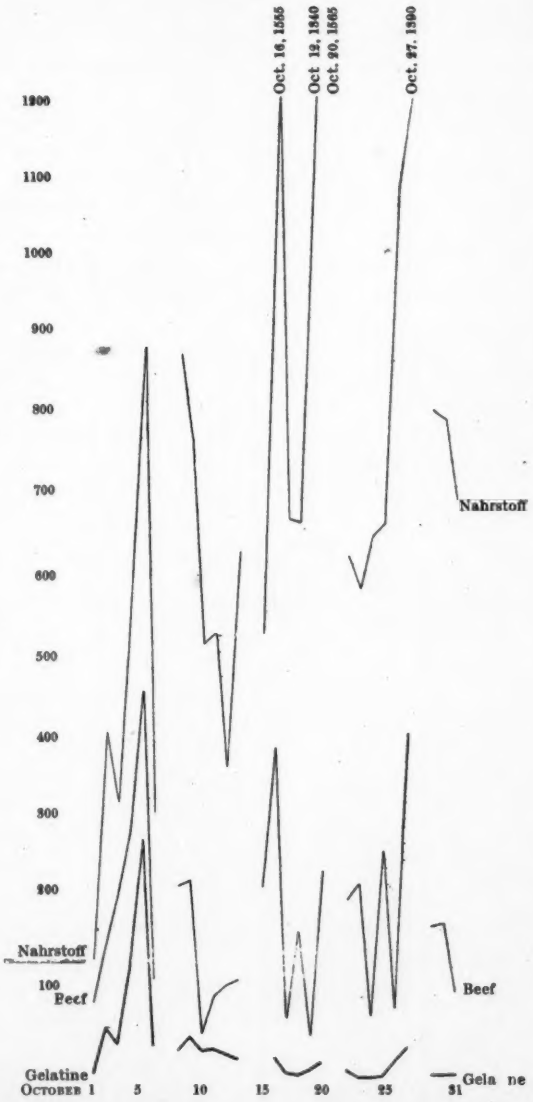
is pictured, a grewsome object. Alexis St. Martin, the favorite hero of text-book writers, is cited to prove that alcohol acts destructively upon the stomach. In view of the fact that the wiry Canadian lived to a great age and was a notorious toper the selection seems unfortunate. Three plates, in widely separated places, show how death overtook the fish in aquaria when extracts of tobacco were added to the water. The book is marred by a few glaring errors, such as the statement that chloroform was introduced as an anaesthetic by W. T. G. Morton.

It is much easier to criticize than to write a manual of hygiene for grammar schools. The laws of most States almost force the author to exaggeration in his temperance teaching. The intrinsic difficulties of the subject are great. Much will always depend on the teacher's discretion in interpreting any text-book and the present one will be useful in capable hands.

P. G. STILES.

(To face Page 534)

CHART SHOWING DIFFERENCE IN TOTAL COUNT OF BACTERIA IN WATER SUPPLIES DETERMINED UPON NAHRSTOFF AGAR, BEEF AGAR AND BEEF GELATIN



(To face Page 535)

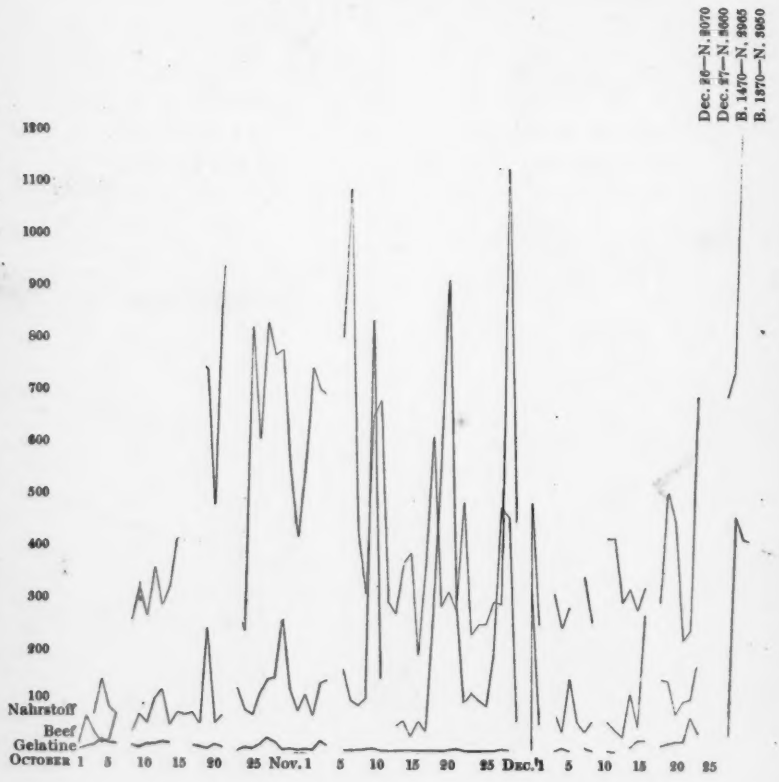



CHART SHOWING DIFFERENCE IN TOTAL COUNT OF BACTERIA IN WATER SUPPLIES DETERMINED UPON NAHRSTOFF AGAR, BEEF AGAR AND BEEF GELATIN